

## AESCHYNOMENEAE (BENTH.) HUTCH. (LEGUMINOSAE) IN AUSTRALIA

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### Summary

The tribe Aeschynomeneae has been revised. Seven genera, viz *Aeschynomene* L. (6 species), *Arachis* L. (1 species), *Cyclocarpa* Afzelius ex Urban (1 species), *Ormocarpum* P. Beauv. (1 species), *Smithia* Aiton (2 species), *Stylosanthes* Swartz (5 species) and *Zornia* J. Gmelin (17 species), occur in Australia. With the exception of *Zornia* (discussed previously) all genera are dealt with in this paper. All taxa are described and keys to the subtribes, genera and species (in each genus) and distributional maps of the species are provided. No new taxa are described in this account.

*Aeschynomene*, *Arachis* and *Stylosanthes* have been introduced into Australia (some probably from pre European times) and have become naturalised. *Arachis* was introduced for its fruits and *Aeschynomene* and *Stylosanthes* for trials as pasture legumes.

### AESCHYNOMENEAE

Tribe Aeschynomeneae (Benth.) Hutch., Gen. Fl. Pl. 1: 470 (1964).

Tribe Hedysareae subtribe Aeschynomeninae Benth. in Benth. & Hook., Gen. Pl. 1: 448 (1865).

Rudd in Polhill & Raven, Adv. Legume Syst. 1: 347–354; 349, f. 1; 351, f. 2 (1981).

Herbs, shrubs or rarely small trees, sometimes glandular punctate with pellucid dots or with tubercular-based (hispid) hairs, or glandular hairs. Leaves alternate, 2- or 3-foliolate, or pari- or imparipinnate; leaflets alternate or opposite. Stipules attached at their base, or peltate and appendaged below point of attachment into a basal spur; stipels absent. Inflorescences axillary or terminal, racemose, spicate, paniculate, fasciculate or subcymose, or flowers solitary; bracteoles paired, rarely absent. Calyx campanulate with 5 subequal lobes, or bilabiate with the vexillary lip entire or 2-fid, the carinal lip entire or 3-fid. Petals clawed, standard elliptic, orbicular or obovate, entire or emarginate; wings often transversely plicate; keel incurved. Stamens 10, filaments connate into a sheath, often splits above into 2 lateral bundles of 5; anthers uniform, rarely dimorphic (*Stylosanthinae* and *Poiretiinae*), dorsifixed, versatile or basifixed. Ovary mostly stipitate; style filiform; stigma small, terminal. Fruits jointed, straight, curved or plicate; articles indehiscent or rarely dehiscent; rarely fruits unjointed and geocarpic (*Arachis*); seeds reniform, ovoid, oblongoid or ellipsoid, with a small hilum.

Twenty five genera, in tropical and warm temperate countries. Seven genera occur in Australia, three of these, viz *Aeschynomene*, *Arachis* and *Stylosanthes* have been introduced and have become naturalised.

Four of the five subtribes recognised by Rudd (1981), viz Aeschynomeninae, Ormocarpinae, Poiretiinae and Stylosanthinae are represented in Australia. Only Discolobiinae is not represented here.

### Key to the subtribes and genera in Australia

1. Pellucid dots or pustular glands usually present on stems, leaves, stipules and bracts. Inflorescences spiciform with numerous stipule-like bracts enclosing the flowers. Flowers sessile; ebracteolate. Fruit articles reticulate-veined, ornamented with glands or bristles. Leaves 2-foliolate Zornia
- 4.\* (subtribe Poiretiinae)
- Pellucid dots absent. Inflorescence not as above. Flowers sessile or pedicellate; bracteolate. Fruit articles without glands or bristles, smooth, striate or reticulate-veined. Leaves 3–many-foliolate 2

2. Stipules usually adnate to the petiole at the base. Leaflets 3 or 4. Calyx tube (hypanthium) long and filiform bearing petals and stamens at apex; upper 4 calyx lobes connate, lower free . . . . . 3  
 Stipules not adnate to the petiole. Leaflets 5-many, pari- or imparipinnate. Calyx tube short, campanulate with 5 subequal lobes, or bilabiate with entire or 2- or 3-fid lips . . . . . 4
3. Leaves 3-foliolate. Fruits 2-articulate, small, beaked, not geocarpic. Flowers composed of 1-flowered spikes placed in axil of primary bracts, lower most in axil of ordinary leaf, each flower accompanied by a secondary bract and 1 or 2 bracteoles . . . . . **Stylosanthes**  
 3.\* (subtribe Stylosanthinae)  
 Leaves 2-paired. Fruits not jointed, large, geocarpic. Flowers in short, sessile spikes, each flower subtended by 2 bracts . . . . . **Arachis**  
 3.\* (subtribe Stylosanthinae)
4. Fruits curved into a ring, or plicate. Stipules appendaged below point of attachment into an unequally bilobed spur; one lobe of spur long and attenuate, acuminate, the other short and erose . . . . . 5  
 Fruits linear and long, straight or slightly curved. Stipules basally attached, or appendaged below point of attachment into an unlobed spur . . . . . 6
5. Fruits curved into a ring, not enclosed in the calyx. Bracts and bracteoles membranous. Inflorescences umbelliform racemes. Leaflets 3- or 4-paired . . . . . **Cyclocarpa**  
 1.\* (subtribe Aeschynomeninae)  
 Fruits plicate, enclosed in the calyx. Bracts and bracteoles scarious. Inflorescences subumbellate or scorpioid cymes or racemes. Leaflets (3-)5-11-paired . . . . . **Smithia**  
 1.\* (subtribe Aeschynomeninae)
6. Articles  $\pm$  quadrate, hemispherical or  $\pm$  globose, finely reticulate veined. Calyx tube campanulate with 5 subequal lobes, or bilabiate with entire or 2- or 3-fid lips. Leaves pari- or imparipinnate, not fasciculate on young shoots . . . . . **Aeschynomene**  
 1.\* (subtribe Aeschynomeninae)  
 Articles narrow and elongate, ellipsoid, with strong continuous nerves on sides. Calyx tube campanulate, 5-lobed, 2 upper ones joined to about half-way, lower lobe the longest. Leaves imparipinnate, often fasciculate on young shoots . . . . . **Ormocarpum**  
 2.\* (subtribe Ormocarpinae)

**Note:** 1. Throughout the following account, the calyx is measured from the base to tip of the lobes, and the length of the stipules, bracts and petals include the spur or claw.

2. In the list of specimens examined, only the institutions from which duplicates are seen are cited.

### Subtribe 1. AESCHYNOMENINAE

Subtribe **Aeschynomeninae** Rudd in Polhill & Raven, Adv. Legume Syst. 1: 352 (1981).

Leaves without pellucid dots, usually sensitive, 5-many-foliolate, pari- or imparipinnate. Flowers pedicellate. Calyx tube campanulate with 5 subequal lobes, or bilabiate with entire or 2- or 3-fid lips. Ovary stipitate, conspicuously jointed. Articles of fruit finely reticulate veined.

Eight genera, three in Australia (*Aeschynomene*, *Cyclocarpa* and *Smithia*).

\* Denotes the order in which the subtribes occur in the following account.



*Aeschynomene*

**Aeschynomene** L., Sp. Pl. 2: 713 (1753). Type: *A. aspera* L.

Benth., Fl. austral. 2: 226–227 (1864); Bailey, Qd Fl. 2: 406–408 (1900); Rudd, Contr. U.S. Natl Herb. 32(1): 1–124 (1955); J. Wash. Acad. Sc. 49(2): 45–52 (Feb 1959); Reinwardtia 5(1): 23–36 (Jun 1959); Verdc., Fl. Trop. E. Afr. Legum.-Pap. 3: 364–406 (1971).\*

\* with illustration.

**Derivation of name:** from Greek *Aischynomene* (modest, ashamed) the name given by Pliny to some plants with sensitive leaves.

Herbs or shrubs; usually hispid. Leaves pari- or imparipinnate; leaflets subopposite or alternate, small, entire or serrulate, 1–3-nerved, usually sensitive. Stipules paired, membranous or foliaceous, striate, basally attached or appendaged below point of attachment into a basal spur, usually persistent. Inflorescences axillary or terminal, few-flowered, open, racemose or  $\pm$  paniculiform, rarely flowers solitary; bracts mostly striate, persistent; bracteoles paired, appressed to calyx, striate, deciduous. Calyx campanulate, with 5 subequal lobes, or deeply bilabiate, upper lip entire or 2-fid, lower usually 3-dentate. Standard elliptic, obovate or orbicular, abruptly shortly clawed, entire or emarginate; wings obovate-oblong attenuate into a short claw, straight or  $\pm$  falcate, usually with a lateral spur and small pockets on its blade; keel  $\pm$  obovate, incurved, the lobes usually partly joined. Staminal tube split into 2 groups of 5, filaments free half-way, anthers uniform, dorsifixed. Ovary linear, sessile or stipitate, style persistent, stigma capitate. Fruits subsessile or stipitate, linear or oblong, cuspidate (remnant style), lower margin usually crenate, (1–)2–18-articulate; articles subquadrate, ellipsoid or semiorbicular, laterally compressed, reticulate veined, smooth or tuberculate, indehiscent or dehiscent by lower sutures. Seeds reniform or oblong, smooth.

About 150 species, mainly in tropical America and Africa, with a few in Asia, New Guinea and Australia. Six species in Australia, all probably naturalised.

*Aeschynomene* is distinguishable by the long, linear, articulated pods, sensitive leaves with usually many small leaflets and few-flowered, lax, open inflorescences.

J. Vogel's (1838) division of the genus into two sections, is retained here.

**Section 1.** *Aeschynomene* L. – Stipules spurred. Calyx bilabiate.

**Section 2.** *Onchopodium* J. Vogel – Stipules basally attached. Calyx campanulate; lobes 5, subequal.

Rudd (1955), recognised five series under sect. *Aeschynomene* and three series under sect. *Onchopodium*. Two series viz ser. *Americanae* (with 2 species) and ser. *Indicae* (with 2 species) of sect. *Aeschynomene*, and one series viz ser. *Viscidulae* (with 2 species) of sect. *Onchopodium* occur in Australia.

The species in Australia are sometimes difficult to separate when not in fruit and a whole series of characters have been used in the following key to differentiate them.

**Key to the species**

1. Stipules with a basal appendage. Calyx deeply 2-lipped. Leaves 12–112-foliolate; leaflets usually narrowly oblong, sometimes  $\pm$ falcate . . . . . 2  
(section *Aeschynomene*)
- Stipules not with a basal appendage. Calyx campanulate, with 5 subequal lobes. Leaves 5–12-foliolate; leaflets obovate or elliptic oblong . . . . . 5  
(Section *Onchopodium*)  
(series *Viscidulae*)

2. Leaflets with 1 main nerve (midvein), not falcate . . . . . 3  
(series *Indicae*)  
Leaflets with 2 or 3 conspicuous longitudinal nerves, usually  $\pm$   
falcate . . . . . 4  
(series *Americanae*)
3. Fruits 1–5-articulate; articles 10–15  $\times$  7.5–9 mm, margins verrucose at maturity. Flowers 12–18 mm long. Leaves (20–)44–112-foliolate. Stipules prominently 6–11-nerved, not hyaline margined. Stems thick and spongy . . . . . 1. *A. aspera*  
Fruits (3–)6–10-articulate; articles 3–5.5  $\times$  3–5 mm, the centres only verrucose at maturity. Flowers 7–9 mm long. Leaves 8–22-foliolate. Stipules obscurely 3–5-nerved, hyaline margined. Stems slender or thick and fistular, not spongy . . . . . 2. *A. indica*
4. Ovary and fruit glabrous or puberulous. Fruits spreading  $\pm$  falcate, upper margin  $\pm$  entire, lower ones deeply indented between seeds; joints between articles short; articles semiorbicular, thick-walled. Leaves 26–60-foliolate; leaflets 6–14.5 mm long, usually 3-nerved. Flowers purple . . . . . 3. *A. americana*  
Ovary villous. Fruits deflexed, hispid, not falcate, slightly indented on both margins; joints as long as articles; articles globose or ellipsoid, thin-walled. Leaves 16–38-foliolate; leaflets 4–9 mm long, 2- (or 3)-nerved. Flowers usually yellow . . . . . 4. *A. villosa*
5. Stems with fine appressed hairs only. Leaves 5–9-foliolate; petiole and rachis 3–15 mm long. Stipes of fruits (2.5–)4.5–7.5 mm long . . . . . 5. *A. brevifolia*  
Stems with spreading hispid hairs, as well as glandular hairs and  $\pm$  curved fine hairs. Leaves 9–12-foliolate; petiole and rachis (8–)15–21 mm long. Stipes of fruits 2–3(–6) mm long . . . . . 6. *A. micranthos*

### Section 1. *Aeschynomene* L. Type: *A. aspera* L.

Stipules appendaged below point of attachment into a spur at base. Calyx deeply bilabiate, upper lip 2-fid or entire, lower one 3-dentate.

Five series, two, viz series *Americanae* (2 species: *A. americana* and *A. villosa*) and series *Indicae* (2 species: *A. aspera*, *A. indica*), in Australia.

Series *Indicae* Rudd, Contr. U.S. Natl Herb. 32(1): 55 (1955). Type: *A. indica* L.

Leaves 1-costate.

1. *Aeschynomene aspera* L., Sp. Pl. 2: 713 (1753). Type: Ceylon, *P. Herman* (n.v.).

Rudd, Reinwardtia 5: 29–30 (1959); Backer & Bakh., Fl. Java 1: 600 (1963).

*A. aspera* var. *oligartha* F. Muell., Vict. Nat. 8: 136 (1892). Type: Port Darwin, Northern Territory, in 1891, *N. Holtze* 1332 (holo: MEL).

Robust erect herbs to 1.25 m high; stems thick and spongy at base, hispid. Leaves (20–)44–112-foliolate; petiole and rachis 6–22 cm long, sparsely hispid or glabrous; petioles pulvinate at base; leaflets linear oblong, 7–16  $\times$  1.5–3 mm (upper and lower leaflets smaller); apex obtuse, subacute or  $\pm$  truncate, mucronate; base subobtuse, oblique; margins entire ciliate; midrib usually black, lateral nerves obscure; petiolules to 0.5 mm long. Stipules basally spurred, narrowly ovate, 8–19  $\times$  1.5–3 mm, prominently 6–11-nerved; spur short, truncate or erose. Inflorescences racemose, 1–3-flowered, peduncles 0.6–3 cm long, hispid; bracts ovate-cordate, acuminate, 3–5  $\times$  2–3 mm, obscurely 5-nerved, glabrous or hispid, ciliate. Flowers 1.2–1.8 cm long; pedicels 5–10 mm long, hispid; bracteoles ovate, obtuse, 2–2.5  $\times$  1–2 mm, hispid, nerves obscure. Calyx 2-lipped, 8–10 mm long, conspicuously striate; lips ovate, one entire or retuse, sparsely hispid, the other 3-dentate. Petals yellow; standard obovate, 11–15  $\times$  14–17 mm, glabrous except hairy upper margins; wings 12.5–16 mm long; keel 14–17.5  $\times$  7–9 mm. Stamens 15–20

mm long, filaments alternately long and short. Fruits linear-oblong, 4.2–6.1 cm long, margins crenulate, smooth, very strongly verrucose at maturity; (1–)3–5-articulate; articles subquadrate, 10–15 × 7.5–9 mm, hispid, ± rugose at centre (at maturity); stipes 0.9–2 cm long, hispid. **Fig. 1A.**

**Specimens examined:** Northern Territory. Port Darwin, in 1891, *Holtze* (MEL); Bullkine Billabong, Wagait Reserve, 12°55'S, 130°33'E, Apr 1981, *Dunlop & Craven* 5917 (DNA); Approx. 5 km N of Nathan River Stn, May 1985, *Leach* 617 (DNA). South Australia. Charlotte Waters, in 1887, *Byrne* (MEL). Queensland. COOK DISTRICT: About 200 m E of Watson River about 27 km upstream from Arukun, May 1982, *Clarkson* 4381 (BRI, DNA); N of Silver Plains towards Massey Ck, Aug 1978, *Kanis* 2033 (BRI).

**Distribution and habitat:** Native of South East Asia where it is widespread. Naturalised in Australia (**Map 1**) at the edges of water holes, in swampy areas and flood plains with their stems rooted in 10–50 cm of water.

*A. aspera* can be distinguished from other species in Australia by its large flowers; by the few large articles of the fruits and strongly verrucose margins of mature fruits; by the thick, spongy stems, and robust habit.

**Uses:** The pith is said to be used as a cork substitute in South East Asia.

**Note:** The var. *oligartha* F. Muell. is not retained here because the characters of the fruit used to distinguish the variety falls within the range of the typical variety.

2. *Aeschynomene indica* L., Sp. Pl. 2: 713 (1753). **Type:** Neli-Tali, Malabar, India: 31, t. 18, in Rheede Hort. Malab. 9 (1689).

Benth., Fl. austral. 2: 226 (1864); Bailey, Qd Fl. 2: 407 (1900); Domin, Biblioth. Bot. 89: 207 (1921); Rudd, Reinwardtia 5(1): 30 (1959); Verdc., Man. New Guinea Legumes 367; 369, f. 85 (1979).

For synonyms see Rudd *loc. cit.*

Erect, usually much branched herbs or subshrubs to 2 m high; stems slender, or thick and fistular towards base, sparsely hispid or glabrous. Leaves sensitive, 8–22-foliolate; petiole and rachis (2–)5–10.5 cm long, hispid; leaflets linear oblong, 3–12 × 1–3 mm, apex ± rounded, mucronate; base rounded, oblique; entire or serrulate; glabrous; midrib prominent, lateral nerves obscure; petiolules to 0.2 mm long. Stipules basally spurred, narrowly ovate or elliptic, acuminate, 5–18 × 1–3.5 mm, usually hyaline margined, obscurely 3–5-nerved; spur acute or erose. Inflorescences racemose, 0.6–2 cm long, 1–5-flowered, peduncles hispid; bracts ovate-cordate, acuminate, 2–6 × 1–2.5 mm, subentire or serrulate, obscurely nerved. Flowers 7–9 mm long; pedicels to 2 mm long, hispid; bracteoles ovate, 2–3 × 1–1.5 mm, subentire or serrulate, nerves obscure. Calyx 2-lipped, 4–6 mm long, lips narrowly oblong, one 2-fid, the other 3-dentate, glabrous, nerves absent. Petals yellow with orange flush; standard broadly elliptic, 6.5–9 × 4–6 mm; wings 6–7.5 mm long; keel 7–9 mm long. Stamens 7–9 mm long. Fruits linear oblong, 1.2–5 cm long, straight or slightly curved, upper margin straight, lower slightly crenate, 3–10-articulate; articles subquadrate, 3–5.5 × 3–5 mm, finely reticulate veined in the centre, sparsely hispid or glabrous; strongly rugose with ridges and tubercles at maturity; stipes recurved, 4–11 mm long, hispid or glabrous; seeds dark brown or black, 3 × 2 mm. **Fig. 1B.**

**Selected specimens:** Western Australia. Coondiner Pool, about 71 km N of Newman, Mar 1984, *Newbey* 10068 (PERTH); Bindoola Creek, 8.5 km WSW of Home Valley H.S., Mar 1978, *Lazarides* 8617 (BRI, DNA). Northern Territory. Tomahawk Soak, Utopia, Jun 1955, *Chippendale* 1204 (DNA); Stirling Stn, near 9 mile waterhole, Aug 1985, *Leach & Smith* 702 (DNA); Arnhem Highway, 19.5 km NW Nourlangie Ranger Stn, May 1980, *Craven* 5442 (DNA). South Australia. Callamurra Waterhole, Cooper Creek, 6 miles [9.6 km] E of Innamincka H.S., May 1966, *Smyth* 66 (AD). Queensland. COOK DISTRICT: 61 km S of Cooktown, Apr 1975, *Halliday* 397 (BRI). BURKE DISTRICT: Green Creek about 33 km NW on road to Normanton, Apr 1973, *Henderson* 1779 (BRI). NORTH KENNEDY DISTRICT: ± 12 km NW of Proserpine, Apr 1980, *Anderson* 2001 (BRI). GREGORY NORTH DISTRICT: Tranby, May 1936, *Blake* 11422 (BRI). WARREGO DISTRICT: 10 km SE of Charleville along Boatman Rd, Mar 1976, *Purdie & Boyland* 37 (BRI). PORT CURTIS DISTRICT: Rockhampton, Feb 1980, *Stanley* 541 (BRI). MORETON DISTRICT: Serpentine Ck, approx. 11 km NE of Brisbane, Jan 1973, *Durrington* 500 (BRI). New South Wales: Narran R. on Goodooga – Lightning Ridge Road, Mar 1978, *Wilson* 1793 (BRI).

**Distribution and habitat:** Native probably of South America (*fide* Rudd 1959), widespread in the tropics and subtropics. It is the most common *Aeschynomene* species in Australia, naturalised in northern Australia, eastern Queensland and New South Wales, also in South Australia (**Map 2**); usually in wet places e.g. flood plains, fresh water swamps and sandy banks near permanent water.

*A. indica* is distinguishable by the greenish colour of dried plants, by the numerous small oblong leaflets per leaf, and by the linear long fruits with (3-)6-10,  $\pm$  quadrate articles which are brown and verrucose in the centre at maturity.

**Common name:** Budda pea

**Uses:** Used as a fodder for sheep and cattle. It is a troublesome weed of summer crops in Queensland.

Series *Americanae* Rudd, Contr. U.S. Natl Herb. 32(1): 22 (1955).

**Type:** *A. americana* L.

Leaves 2-several-costate.

**3. Aeschynomene americana** L., Sp. Pl. 2: 713 (1753). **Type:** Jamaica, *Sloane*, lecto: BM (*n.v.*)  
Rudd, Contr. U.S. Natl Herb. 32(1): 23-30 (1955), Reinwardtia 5: 25 (1959);  
Verdc., Man. New Guinea Legumes 367 (1979).

Erect or rarely decumbent, hirsute, viscid subshrubs to 2 m high; usually densely hispid with pale or yellow hispid hairs with mostly dark tuberculate bases, sometimes subglabrous or with glandular hairs on stems, leaf axes, peduncles and pedicels. Leaves (26-)36-60-foliolate; petiole and rachis 2-4 cm long; leaflets linear oblong, subfalcate, (6-)7-11(-14.5)  $\times$  1-2 mm (upper ones smaller), apex oblique acute or obtuse, mucronate; base obtuse,  $\pm$  oblique; serrulate towards apex; glabrous except ciliate margins, prominently 3-nerved with longitudinal nerves, often with 1 or 2 short faint ones near base; petiolules to 2 mm long. Stipules basally spurred, narrowly ovate, attenuate-acuminate, 11-21  $\times$  1-2.5 mm, conspicuously 7-13-nerved, usually hispid at point of attachment only; spur acute or erose. Inflorescences open, racemose, 1.5-4.7 cm long, (2-)4-6-flowered; peduncles flexuose; bracts ovate-cordate, acuminate, 3-5  $\times$  2-4 mm, serrate, hispid. Flowers 5-7 mm long; pedicels filiform, 4-7 mm long; bracteoles narrowly ovate, acute or acuminate, 2-4.5  $\times$  0.5-1 mm, margins serrate, hispid. Calyx bilabiate, 4.5-5 mm long, usually thin with faint nerves; lips narrowly ovate, ciliate, one lip entire or 2-fid, the other 3-dentate. Petals mauve brown or purple, or with purple streaks; standard orbicular, 6-6.5  $\times$  4-5 mm, apex ciliate; wings 6-7  $\times$  2-2.5 mm; keel 6-7  $\times$  2.5-3 mm. Stamens 5-7 mm long, staminal sheath divided to about middle. Ovary glabrous or sparsely hairy or ciliate. Fruits spreading, arcuate linear, subfalcate, 2-3 cm long, upper margins  $\pm$  entire, lower deeply indented between seeds, with narrow, short definite articulations between articles, (3-)5-7-articulate; articles semiorbicular, 2.5-4  $\times$  3-5 mm,  $\pm$  thick walled, finely reticulate veined (prominent near margins), puberulent or glabrous, verrucose in centre at maturity; stipe to 2 mm long, glabrous. **Fig. 1C.**

**Specimens examined:** Northern Territory. Berrimah Farm, 12°26'S, 130°55'E, May 1981, *Rankin* 2587 (BRI,CANB,DNA); Darwin, May 1984, *Rankin* 2930 (CANB). Queensland. BURKE DISTRICT: Clifdale Stn airstrip, Nicholson River area, W of Burketown, Apr 1985, *Johnson* (BRI). NORTH KENNEDY DISTRICT: Cordelia, May 1985, *Hoult* (BRI).

**Distribution and habitat:** Native of South America where it is widespread, and extending to tropical America. Naturalised in Indonesia, Philippines, New Guinea and northern Australia (**Map 3**); usually in dry areas along roadsides.

*A. americana* can be distinguished by the narrowly oblong subfalcate leaflets with an oblique apex and 3 longitudinal nerves; by the spreading, arcuate linear  $\pm$  falcate fruits with deeply crenate lower margins and with short evident joints between (3-)5-7, semiorbicular articles. It is very closely related to *A. villosa* Poiret and the species are difficult to separate when not in fruit. The two species have been combined and *A. villosa* reduced under *A. americana* by Urban (1905) but they are retained as distinct species here because of the differences in fruits (see discussion under *A. villosa*).

Rudd (1955, pp. 24-27) recognised three varieties under *A. americana*. The plants naturalised in Australia are probably referable to the typical variety.

4. *Aeschynomene villosa* Poiret in Lam., Encyc. Meth. Bot. Suppl. 4: 26 (1886). **Type:** Puerto Rico, *Ledru* (n.v.).  
 Rudd, Contr. U.S. Natl Herb. 32(1): 32–37 (1955), Reinwardtia 5: 27–28 (1959); Verdc., Man. New Guinea Legumes 368 (1979).  
 [A. *americana* auct. non L.: F. Muell., Fragm. 12: 19 (1882); Bailey, Qd Fl. 2: 407 (1900), quoad specimen Endeavour River, *Persieh*]

Herbs to 1 m high with decumbent stems, usually densely viscid-hispid with yellow or brown hairs on stems, leaf axes, peduncles and pedicels, or subglabrous. Leaves (16–) 22–30(–38)-foliolate; petiole and rachis 1–4 cm long; leaflets narrowly elliptic-oblong,  $\pm$  falcate, (4–)6–8(–9)  $\times$  1–2.5 mm (upper ones smaller); apex oblique, acute, mucronate; base obtuse or  $\pm$  rounded; margins entire or slightly serrulate towards apex; glabrous; prominently 2- (or 3)-nerved with longitudinal nerves, often with 1 or 2 short faint ones near base; petiolules to 0.2 mm long. Stipules basally spurred, narrowly ovate, acuminate, (6–)8–16  $\times$  (0.5–)1–2 mm, prominently 5–7-nerved, glabrous; spur truncate or erose. Inflorescences open, racemose or paniculate, (1.5–)3–10 cm long, 2–6 (–9)-flowered; bracts ovate-cordate, acuminate, 2–6  $\times$  1–2 mm, 7–13-nerved, hispid-ciliate. Flowers 4–5 mm long; pedicels 2–4 mm long; bracteoles narrowly ovate, acuminate or acute, 1–3  $\times$  0.5–1 mm, 3–7-nerved, hispid-ciliate. Calyx bilabiate, 3–4 mm long,  $\pm$  membranous, nerves not apparent; lips narrowly ovate, one 2-dentate, the other 3-dentate. Petals yellow; standard suborbicular, 4–5  $\times$  2–3 mm; wings 4–4.5  $\times$  1–1.5 mm; keel 3–5  $\times$  1–1.5 mm. Stamens 4–5 mm long, staminal sheath deeply divided into two. Ovary densely villous. Fruits deflexed,  $\pm$  oblong, (0.6–)0.9–2 cm long, slightly indented between seeds on both margins, pale brown with darker margins and dark tuberculate bases of hispid hairs; (1–) 3–5(–7)-articulate, joints between articles nearly as long as the articles; articles subglobose or ellipsoid, 2.5–3.5  $\times$  3–4 mm, thin-walled, hispid; margins thick often breaking away from the body of the articles; stipes 1–3 mm long, hispid. **Fig. 1D.**

**Selected specimens:** Western Australia. 19 km SE of East Wyndham – Kununurra Rd, Jul 1974, *Carr* 3232 and *Beauglehole* 47010 (PERTH); Port Warrender, Mitchell Plateau, Jun 1976, *Kenneally* 5258 (PERTH). Northern Territory: Burns Rd, Berry Springs, May 1953, *Rankin* 2716 (DNA); Katherine Gorge National Park, Apr 1977, *Dunlop* 4512 (DNA); Fish River H.S./Gorge area, Jun 1974, *Maconochie* 2008 (CANB, DNA). Queensland. COOK DISTRICT: 6 miles [9.6 km] from Petford on Herberton Rd, Apr 1962, *McKee* 9425 (CANB). BURKE DISTRICT: Old Corinda Outstation, NW of Doomadgee, May 1974, *Pullen* 9082 (CANB). NORTH KENNEDY DISTRICT: Bodalla, 40 km N of Pentland, May 1989, *Glenwright* 316 (BRI).

**Distribution and habitat:** Native of South America, where it is widespread, and ranges from Central America to northern South America. Naturalised in old world tropics including South East Asia, New Guinea and northern Australia (**Map 4**); usually along roadsides, creeks and lagoons, in moist soil.

*A. villosa* is recognisable by the hispid stems and fruits and also by the narrowly oblong subfalcate leaflets with oblique apex and prominent 2 or 3 longitudinal nerves. It is very closely related to *A. americana* L. which has similar leaves and indumentum and the two species are difficult to distinguish when not in fruit.

The two species have been combined by Urban (1905). He reduced *A. villosa* as a variety under *A. americana*, and was followed by several authors. But Rudd (1955) in her revision of the American species of *Aeschynomene*, retained *A. villosa* as a distinct species and recognised three varieties under it. The latter is followed here because of the differences of the fruits and also because the specimens available for study of the two species were too few to ascertain their range of variation.

The Australian plants are probably referable to var. *villosa*, although the leaflets are usually longer than allowed in var. *villosa* and approach var. *longifolia* (Micheli) Rudd, but differ from the latter in the character of the inflorescence.

**Section 2. Onchopodium** J. Vogel, Linnaea 12: 86 (1838). **Type:** *A. falcata* (Poiret) DC. Stipules attached by their base; basal appendage absent. Calyx campanulate, lobes 5, subequal.

Three series, only series *Viscidulae* (2 species: *A. brevifolia* and *A. micranthos*) in Australia.

Series *Viscidulae* Rudd, Contr. U.S. Natl Herb. 32(1): 71–72 (1955). **Type:** *A. viscidula* Michx.

Stems prostrate or suberect; leaflets mostly obovate; fruits small; articles 2–5.5 mm diameter.

**5. *Aeschynomene brevifolia* L.f. ex Poiret\* in Lam., Encyc. 4: 451 (1797). **Type:** Madagascar, 1770–71, *P. Commerson* (n.v.).**

DeCandolle, Prod. 2: 322 (1825); Rudd, Contr. U.S. Natl Herb. 32(1): 88 (1955), J. Wash. Acad. Sc. 49 (2): 45: 47 (1959).

*A. falcata* var. *paucijuga* Benth., Fl. austral. 2: 221 (1864) p.p.; Bailey, Qd Fl. 2: 407 (1900) p.p.; Domin, Biblioth. Bot. 89: 208 (1921) p.p.

[*A. falcata* auct. non (Poiret) DC.: F. Muell., Fragm. 12: 20 (1882) p.p.]

Slender tufted herbs with prostrate (rarely ascending) stems to 30 cm long; stems with fine appressed hairs, sometimes subglabrous. Leaves 5–9-foliolate; petiole and rachis (7–) 8–17 mm long, hispid; petioles (3–)5–6(–12) mm long; leaflets obovate or ± elliptic oblong, 5–8(–12) × 2.5–4(–5) mm, apex ± truncate, rounded, mucronate; base ± truncate, unequal; glabrous above, finely appressed hairy below, ciliate; conspicuously lateral nerved and reticulate veined; petiolules to 0.5 mm long. Stipules basally attached, ovate acuminate, 1.5–4 × 0.5–1.5 mm, striate, sparsely hairy. Inflorescences usually racemose, 3–5.5 cm long, 3- or 4-flowered; peduncles 0.8–2.1(–5) cm long, sparsely hispid; bracts ovate or subelliptic, acute, 1.5–2 × 1–1.5 mm, ciliate, striate. Flowers 7–8 mm long; pedicels 3–6.5 mm long, hispid; bracteoles elliptic or narrowly ovate, 1–2 × 0.5–1 mm, striate. Calyx campanulate, 3–3.5 mm long, finely appressed hairy outside; lobes 5, subequal, ovate. Petals yellow; standard suborbicular, 7 × 6–7 mm; wings 6–7 × 1.5 mm; keel 6 × 2 mm. Stamens 5 mm long. Ovary densely appressed hairy. Fruit 1- or 2(–5)-articulate, articles ± obloid or semiorbicular, sometimes with short necks between them, 3.5–4 × 4 mm, finely reticulate veined, sparsely appressed hairy or subglabrous; stipes (2.5–)3–4.5(–7.5) mm long, hispid.

**Selected specimens:** Queensland. NORTH KENNEDY DISTRICT: Rangeview about 30 miles [48 km] SE of Ravenswood, May 1954, *Everist* 5548 (BRI). SOUTH KENNEDY DISTRICT: Shaw Island, Nov 1985, *Batianoff* 3358 & *Dalliston* (BRI). PORT CURTIS DISTRICT: 8 miles [12.8 km] W of Biloela, Sep 1964, *Johnson* 2830 (BRI); Gladstone, *Dietrich* 13 (MEL); Middle Percy Island, Mar 1966, *Tryon* (BRI). BURNETT DISTRICT: Gayndah, Dec 1960, *Schoneveld* 317 (BRI). MORETON DISTRICT: Mt Urah, Apr 1983, *Sharpe* 3323 (BRI); Dinmore near Ipswich, Jan 1961, *Pedley* 735 (BRI); Walloon, *Bowmann* (MEL); Taylor Range, Jul 1843, *Leichhardt* (MEL).

**Distribution and habitat:** Native of Madagascar, probably naturalised in Queensland (Map 3); usually on rocky ridges and hillsides.

*A. brevifolia* is distinguishable by the fine appressed hairy stems, small leaves with small, obovate, prominently nerved leaflets and by the long stipes of the fruits. It is very similar to *A. micranthos* in the attributes of leaves and fruits but the latter species differs in having spreading hispid, as well as ± curved fine hairs on stems.

**Typification:** The type of *A. brevifolia* L.f. ex Poiret\* is missing, the specimen in the type folder at PLA is *A. falcata* (Poiret) DC. (BRI microfiche). Nevertheless the specimens in Australia referred to as *A. brevifolia* are a good match with plants from Madagascar under that name, and also agree with available literature.

**Notes on *A. brevifolia* complex:** Plants from Queensland previously placed under *A. brevifolia* s. lat. are very variable with at least two taxa present, viz one with fine appressed hairs on the stem (treated here as typical *A. brevifolia* s. str.) and the other taxon with coarse spreading hispid hairs (some of these sometimes gland-tipped), as well as fine ± curved hairs (referred here to *A. micranthos*). Typical *A. brevifolia* resembles *A. falcata* (Poiret) DC., differing in the characters of the fruit, while *A. micranthos* approach some of the forms under the very variable *A. brasiliensis* (Poiret) DC. Identification of these species (*A. brevifolia* s. lat., *A. brasiliensis* and *A. falcata*) is therefore difficult, because similar looking plants can be found under these names.

\* The correct author citation for *A. brevifolia* should be L.f. ex Poiret not L. ex Poiret, because it was the younger Linnaeus who saw Commerson's collections from Madagascar and probably named the plant (*vide* his (Linnaeus) letter to his friend Claes Alstroemer, April 1781, in Smith Herbarium (BRI microfiche)).



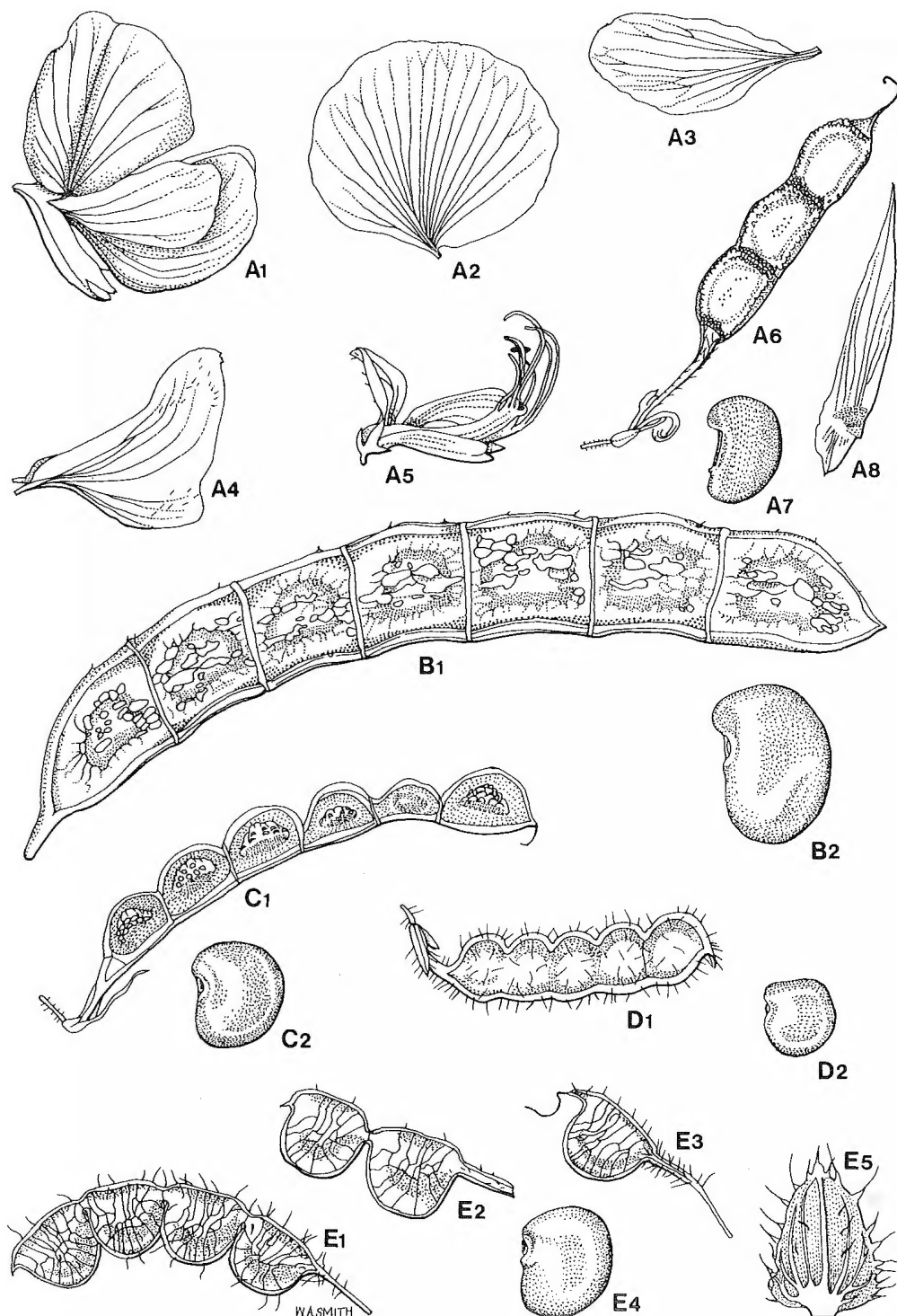


Fig. 1. *Aeschynomene* spp.: A. *A. aspera*: A<sub>1</sub>, flower  $\times 2$ ; A<sub>2</sub>, standard  $\times 2$ ; A<sub>3</sub>, wing  $\times 2$ ; A<sub>4</sub>, keel  $\times 2$ ; A<sub>5</sub>, calyx and stamens  $\times 2$ ; A<sub>6</sub>, fruit  $\times 1$ ; A<sub>7</sub>, seed  $\times 2$ ; A<sub>8</sub>, stipule  $\times 2$ . B. *A. indica*: B<sub>1</sub>, fruit  $\times 3$ ; B<sub>2</sub>, seed  $\times 6$ . C. *A. americana*: C<sub>1</sub>, fruit  $\times 3$ ; C<sub>2</sub>, seed  $\times 6$ . D. *A. villosa*: D<sub>1</sub>, fruit  $\times 3$ ; D<sub>2</sub>, seed  $\times 6$ . E. *A. micranthos*: E<sub>1</sub>, E<sub>2</sub>, E<sub>3</sub>, fruit  $\times 3$ ; E<sub>4</sub>, seed  $\times 6$ ; E<sub>5</sub>, stipule  $\times 12$ . A, Dunlop & Craven 5917; B, Gittens 720; C, Johnson 4207; D, Maconochie 2008; E, Anderson 3637.



*A. brasiliana* (Poiret) DC. and *A. falcata* (Poiret) DC. have been cultivated in Australia for a very long time but as yet not reported to be naturalised. Yet in the past both names have been applied to naturalised Australian species. Confusion existed from the time of Bentham; he considered the Australian plants to be the same as the South American ones under *A. falcata* var. *paucijuga* Benth. (1864, p. 227). He reduced *A. micranthos* (Poiret) DC. from Madagascar under it. But Rudd (1955, p. 88) placed *A. falcata* var. *paucijuga* Benth. under *A. falcata* var. *falcata*. She placed the Australian species under *A. brevifolia* L.f. ex Poiret (1959, p. 47) and reduced *A. micranthos* under it. Following Rudd, the Queensland specimens were previously placed under *A. brevifolia* s. lat. Although the plants look very similar with similar fruits and leaves, they have been segregated in this account because of the differences in stem indumentum (as indicated above) into *A. brevifolia* and *A. micranthos*. Their differences from closely related *A. falcata* and *A. brasiliana* are indicated in the following key which is based on available material and literature.

1. Stems with fine appressed hairs only. Leaves 5–9(–10)-foliolate. Stipes 2.5–14 mm long . . . . . 2
- Stems with spreading hispid hairs as well as glandular hairs and also  $\pm$  curved fine hairs. Leaves (8–)9–18-foliolate. Stipes 0.5–6 mm long . . . . . 3
2. Fruits falcate, (4–)5–7-articulate. Stipes 6.5–14 mm long. Petioles short (2–5 mm long). Leaves 8–10-foliolate; leaflets mostly oblong-elliptic, obtuse, 8–12  $\times$  3–5 mm. Pedicels appressed hairy . . . . . *A. falcata*
- Fruits not falcate, 1–5-articulate. Stipes 2.5–7.5 mm long. Petioles longer ((3–)5–6(–12) mm long). Leaves 5–9-foliolate; leaflets mostly obovate,  $\pm$  truncate or obtuse, 5–8(–12)  $\times$  2.5–4(–5) mm. Pedicels with spreading hispid hairs . . . . . *A. brevifolia*
3. Petiole with rachis 1.5–4.5 cm long. Leaves (9–)12–18-foliolate; leaflets (8.5–)12.5–18  $\times$  (4.5–)6–10 mm, obtuse or rounded. Stems viscid-hispid, usually densely hispid and glandular hairy. Fruits 2- or 3-articulate, articles 2–4 mm long; stipes 0.5–2(–3) mm long . . . . . *A. brasiliana*
- Petiole with rachis 0.8–2.1 cm long. Leaves 8–10(–12)-foliolate; leaflets 4.5–11.5  $\times$  2.5–5.5 mm,  $\pm$  truncate or obtuse. Stems with dense or sparse hispid hairs and very few glandular hairs . . . . . *A. micranthos*
6. *Aeschynomene micrantha* (Poiret) DC., Prod. 2: 321 (1825); *Hedysarum micranthos* Poiret, Encyc. Meth. Bot. 6: 446 (1804). Type: Madagascar, in 1770–71, P. Commerson (holo: P-JU (BRI: microfiche)).

Rudd, J. Wash. Acad. Sc. 49(2): 47–48 (1959); Verdc., *Kirkia* 9(2): 443 (1974).

*A. falcata* var. *paucijuga* Benth., Fl. austral. 2: 227 (1864) p.p.; Bailey, Qd Fl. 2: 407 (1900); Domin, Biblioth. Bot. 89: 208 (1921) p.p.

[*A. falcata* auct. non (Poiret) DC.: F. Muell., Fragm. 12: 20 (1882) p.p.]

Slender tufted herbs, with prostrate (rarely  $\pm$  ascending) stems to 50 cm long; stems densely or sparsely coarsely hairy with spreading, long or short hispid hairs (sometimes gland-tipped) intermingled with fine  $\pm$  curved hairs. Leaves 9–10(–12)-foliolate; petiole and rachis (8–)15–21 mm long, hispid; petiole 5–9 mm long; leaflets subobovate, 4.5–11.5  $\times$  2.5–5.5 mm; apex obtuse, rounded or subtruncate, mucronate; base truncate or subcordate, oblique; glabrous above, sparsely appressed hairy below, ciliate; conspicuously lateral nerved and reticulate veined; petiolules to 0.5 mm long. Stipules basally attached, ovate or narrowly ovate, acuminate, 2–5  $\times$  1–1.5 mm, striate, puberulous, sparsely ciliate. Inflorescences racemose, 2.3–8 cm long, (1–)2–4-flowered, peduncles 1.6–3(–4.5) cm long, hispid; bracts ovate, acute or acuminate, 1.5–3.5  $\times$  0.5–2 mm, striate, puberulous. Flowers 7–10 mm long; pedicels (2.5–)6–9 mm long, hispid; bracteoles elliptic, 1.5–2.5  $\times$  1 mm, striate, puberulous. Calyx campanulate, 3.5–4.5 mm long, sparsely pilose on outside; lobes 5, subequal, ovate. Petals yellow or orange-yellow; standard suborbicular, 6.5–10  $\times$  6–8 mm; wings 6–9  $\times$  2.5–3 mm; keel 7–9  $\times$  2 mm. Stamens 6–10 mm long. Ovary densely hispid. Fruits 1- or 2(–4)-articulate; articles semiorbicular or oblongoid, 4–5  $\times$  3–3.5 mm, finely reticulate veined, sparsely hairy with fine appressed hairs and hispid hairs; stipes 2–3(–6) mm long, hispid. **Fig. 1E.**

**Specimens examined:** Queensland. COOK DISTRICT: Tinaroo Ck Rd, about 15 km SE of Marceba, Apr 1972, *Staples* 030472/3 (BRI); \*Brown's Ck above Blackdown Stn., Jan 1971, *MacDonald* 19 (BRI). NORTH KENNEDY DISTRICT: Herbert River, Rockingham Bay, May 1868, *Dallachy* (MEL); Ewan, Nov 1930, *Millar* (BRI); Taravale near Hell Hole Ck, 0.5 km E of homestead, Mar 1987, *Jacks* 8221A (BRI); Cape Pallaranda, Feb 1980, *Stanley* 80146 (BRI); \*Pentland, Apr 1935, *Blake* 8401 (BRI). SOUTH KENNEDY DISTRICT: Bowen River, *Bowman* 279 (MEL). PORT CURTIS DISTRICT: Between Broadsound and Thirsty Sound, inner entrance, Sep 1802, *Brown* (BRI); 60 km NW of Yarwun, Mt Larcom Range, Mt Larcom, May 1988, *Gibson* 142 (BRI). MITCHELL DISTRICT: Torrens Ck, Mar 1933, *White* 8698 (BRI). LEICHHARDT DISTRICT: \*about 15 km WNW of Duaringa, Feb 1984, *Anderson* 3637 (BRI).

\* indicates a very hairy form approaching some forms of *A. brasiliana* (Poiret) DC.

**Distribution and habitat:** Madagascar, Mozambique, South Africa and Australia. Probably naturalised in Queensland before 1802 (it was collected by R. Brown in 1802) (**Map 1**); usually in flat plains amongst granite boulders, in dry river beds creeping on stones, and on low dissected hills, in skeletal or sandy soil.

*A. micranthos* is distinguishable by the spreading hairy, hispid stems, small obovate leaflets and 1–4-articulate fruits on long stipes.

**Typification:** The type specimen has not been seen to study the stem indumentum (microfiche at BRI). Nevertheless the Australian plants placed under *A. micranthos* agree in other characters with microfiche of the type and with plants from South Africa under this name; they also agree with available literature and are probably correctly named.

**Note:** *A. micranthos* (as discussed under *A. brevifolia*) was reduced under *A. falcata* var. *paucijuga* Benth. (now *A. falcata* var. *falcata*), by Bentham (1864, p. 227), and under *A. brevifolia* L.f. ex Poiret by Rudd (1959, p. 47), but has been retained as a distinct species in this account because of the differences in stem indumentum and also because it is doubtful that Poiret would have made a mistake and described the same plant twice, even after 6 or 7 years (although these things are said to have happened before).

### Smithia

**Smithia** Aiton, Hortus Kew. ed. 1(3): 496, t. 13 (1789) *nom. cons.*

**Type:** *S. sensitiva* Aiton

Benth., Fl. austral. 2: 227–228 (1864); Bailey, Qd Fl. 2: 408 (1900); van Meeuwen, Reinwardtia 5(4): 443–446 (1961); Rudd in Polhill & Raven, Adv. Legume Syst. 1: 352, f. 2.11 (1981).

**Derivation of name:** after James Edward Smith (1759–1828), one of the most famous of British botanists.

Herbs or subshrubs. Leaves paripinnate; leaflets opposite, 1-nerved, subsessile; stipules appendaged below point of attachment into an unequally bilobed spur, membranous, striate, persistent; one lobe of spur linear and long, acuminate, the other short,  $\pm$  truncate or erose. Inflorescences axillary, usually short densely flowered subumbellate or scorpioid cymes or racemes; bracts small, slightly peltate, scarious, brownish, finely striate; bracteoles 2, usually scarious, finely striate, persistent. Calyx scarious, deeply 2-lipped, finely striate, upper lip entire, lower one toothed. Standard  $\pm$  obovate or suborbicular, usually emarginate; wings free, oblong, laterally spurred and with a series of small pockets on its blade; keel elliptic, united dorsally, free at apex, with a short lateral spur above claw. Stamens united to about 2/3 their length, filaments alternately long and short; anthers uniform, dorsifixed. Disk short. Ovary sessile or shortly stipitate, linear, one margin straight, the other crenate, 2–7-ovuled; style curved; stigma small. Fruits stipitate, plicate, included in the persistent accrescent calyx, 2–7-articulate; articles obovoid or semiorbicular with the broader sides against each other, warty, glabrous; margins smooth or tuberculate; indehiscent. Seeds reniform, compressed.

Thirty species, tropical Africa, Madagascar, New Guinea and Australia; two in Australia.

*Smithia* is characterised by the plicate fruits and scarious bracts. The leaves are similar to those of *Aeschynomene* L., but the fruits are linear and long, straight or falcate, bracts not scarious, and the inflorescence open and lax in the latter genus.

1. Flowers sessile, in a head-like inflorescence . . . . . **1. *S. conferta***  
 Flowers pedicellate, in a long peduncled raceme . . . . . **2. *S. sensitiva***

**1. *Smithia conferta*** Smith, Rees Cycl. 33: 2 (1816). **Type:** not designated.  
 Benth., Fl. austral. 1: 228 (1864); Bailey, Qd Fl. 2: 408 (1900); Van Meeuwen,  
 Reinwardtia 5(4): 445 (1961); Backer & Bakh., Fl. Java 2: 600 (1963); Verdc.,  
 Man. New Guinea Legumes 370–371 (1979).

*S. capitata* Desvaux, J. Bot. 1: 121 (1813) *nom. nud.*

Herbs or subshrubs with spreading, decumbent stems to 1 m, glabrous except bristly leaves. Leaves (6–)10–14-foliolate; petiole 1–2 mm long; rachis 7–17 mm long, with sparse long bristles; leaflets narrowly oblong, elliptic or obovate, 7–12 × 1.5–3(–3.5) mm; apex acute or obtuse; base obtuse, or ± truncate, unequal; margins entire or finely remotely serrulate and bristly; glabrous above, sparsely appressed hispid hairy below; petiolules tumid to 0.5 mm long. Stipules (7–)9–16 × 1.5–2.5 mm, striate, glabrous, upper lobe ovate, acute or acuminate; one lobe of spur long, narrowly ovate acuminate, the other short erose. Inflorescences a leafy head, 1.5–2.5 × 1.7–3.2 cm, comprising of 2–4 flowers in clusters in axil of ordinary (upper) leaves congested into a leafy head; bracts ovate, aristate, 3–3.5 × 2 mm, glabrous. Flowers 7–9 mm long; sessile; bracteoles ovate-elliptic, cuspidate, 4–5 × 2–2.5 mm, sparsely bristly outside. Calyx 6–8 mm long, lips 5–7 × 3–4 mm, narrowly ovate, upper one acuminate, glabrous except for few hairs at apex, lower lip acute, 2-toothed, sparsely long hairy near apex and along the midrib. Petals yellow, standard obovate, 9–10 × 4–5 mm (claw 1.5–2.5 mm long); wings oblong, 8–9 × 1.5 mm (claw 1.5–2.5 mm long); keel obovate, 7–8 × 1.5–2 mm (claw 2–2.5 mm long). Stamens 7–8 mm long. Ovary linear, 3–5-ovuled, glabrous. Fruit 3–5-articulate, articles 1.5–2 × 1.5–2 mm, ± rugose or verrucose; seed brown, smooth, 1–1.5 × 1–1.5 mm.

**Selected specimens:** Northern Territory. Port Darwin, in 1889, *Holtze* 983 (MEL); Nangalala, May 1972, *Reeve* 244 (CANB); 25 miles [40 km] S Giddy River crossing, Jun 1972, *Byrnes* 2675 (DNA); Koongarra area, May 1978, *Dunlop* 4586 (CANB). Queensland. COOK DISTRICT: 4.5 km E of Arukun – Beagle North Camp road, 6–8 km south of Cowplace Ck, Jun 1982, *Clarkson* 4452 (BRI); Hammond Island, Jul 1974, *Heatwole* 252 (BRI); Lockerbie, 10 miles [16 km] WSW of Somerset, Apr 1948, *Brass* 18487 (BRI). BURKE DISTRICT: Wellesley Island, Jun 1963, *Tindale & Aitken* (BRI). NORTH KENNEDY DISTRICT: Townsville, *Pollock* [AQ237539] (BRI).

**Distribution and habitat:** Tropical Asia, New Guinea and northern Australia (northern Queensland and Northern Territory) (**Map 5**); in subcoastal plains, near swamps, margins of lagoons, creek and river banks, in damp sandy soil in *Melaleuca* or *Pandanus* forests.

*S. conferta* is recognisable by the congested head-like inflorescences subtended by young leaves with long bristles.

**2. *Smithia sensitiva*** Aiton, Hort. Kew. ed. 1(3): 496 (1789). **Type:** not designated.  
 van Meeuwen, Reinwardtia 5: 444 (1961); Backer & Bakh., Fl. Java 1: 600 (1963);  
 Verdc., Man. New Guinea Legumes 370; 372, f. 86 (1979).

Tufted diffuse herbs with decumbent, glabrous stems to 60 cm. Leaves (8–)12–22-foliolate; petiole 1–2 mm long; rachis 1–3 cm long; leaflets narrowly oblong or subobovate, 5–11 × 1.5–3.5 mm (upper ones usually smaller), apex obtuse, mucronate, rarely acute or ± truncate; base obtuse or ± truncate; remotely finely serrulate and bristly, upper surfaces glabrous, lower ones with scattered bristles; petiolules to 0.5 mm long. Stipules 7–17 × 1–2.5 mm, glabrous, striate, upper lobe ovate acuminate; one lobe of spur long, linear, acuminate, the other short truncate. Inflorescences in the axil of well spaced leaves, long peduncled racemes, 3–5 cm long, (1–)2–5-flowered; peduncles (0.6–)3–6 cm long, filiform, glabrous, with flowers crowded at their tips; bracts ovate, aristate, 3–6 × 1.5–2 mm, glabrous. Flowers 5.5–7 mm long; pedicels 1–3 mm long, glabrous; bracteoles ovate or ovate-elliptic, 2.5–4 × 1.5–2 mm, cuspidate or acuminate, glabrous. Calyx 5–8 mm long, lobes 4–6 × 3 mm, narrowly elliptic or subobovate, acute or obtuse, glabrous, striate. Petals yellow often tinged with red; standard broadly obovate, (6–)7–8 × 4–6 mm (claw 1–2 mm long); wings oblong, 6.5–7.5 mm long (claw 1–2 mm long); keel elliptic, incurved, 6–7 mm long (claw 1.5–2 mm long). Stamens 6–8 mm long. Ovary 4–8-ovuled, glabrous. Fruits 5–7 mm long, 4–7-articulate; articles 1–1.5 × 2 mm, tuberculate; seeds reddish brown, about 1.5 × 1–1.5 mm. **Fig. 2A.**

**Selected specimens:** Queensland, COOK DISTRICT: Euramo Plains, Jun 1938, *Langdon* (BRI). NORTH KENNEDY DISTRICT: Preston near Proserpine, *Michael* [AQ 237551] (BRI). MORETON DISTRICT: Mt Coolum, Mar 1945, *Clemens* (BRI); Yaroomba about 3 km S of Coolum Beach, 100 m W of Marakari Drive, Mar 1983, *Sharpe* 3296 (BRI); Moreton Island, Mar 1973, *Durrington* 343 (BRI).

**Distribution and habitat:** Africa, New Guinea and Australia (chiefly coastal Queensland) (Map 5); usually grows in wet sandy peaty soil at edge of swamps or in damp places along roads.

*S. sensitiva* is distinguished by the long stalked inflorescences with the flowers clustered towards tip of the long peduncles.

### *Cyclocarpa*

**Cyclocarpa** Afzelius ex Urban\*, Jahrb. bot. Gart. Berlin 3: 248 (1884). **Type:** *C. stellaris* Afzelius ex Urban\*.

J.G. Baker in Oliver, Fl. Trop. Afr. 2: 151 (1871); Urban, Jahrb. Bot. Gart. Berlin 3: 248 (1884); Backer & Bakh., Fl. Java 1: 645 (1963); Verdc., Fl. Trop. E. Afr. Legum. -Pap. 3: 406-407, f. 57 (1971); Rudd in Polhill & Raven, Adv. Legum. Syst. 1: 351, f. 2.16; 353 (1981).

**Derivation of name:** from Greek *Cyclos* (circle); *carpos* (fruit), apparently after the round (in a circle) fruits.

Small herbs. Leaves sensitive, paripinnate; leaflets opposite, 3 or 4 paired, small; stipules appendaged below point of attachment into unequally bilobed spur, membranous; one lobe of spur long, linear acuminate, the other short erose. Inflorescences axillary, few-flowered umbelliform racemes; bracts and bracteoles small, membranous. Flowers pedicellate. Calyx bilabiate, hardly tubular at base, deciduous, lips entire or 2- or 3-fid. Standard obovate, emarginate; wings and keel finely denticulate at apex, wings oblong obovate, oblique, with small pockets; keel obliquely obovate. Stamens connate, the tube splits unilaterally for 1/2 its length into 2 bundles of 5, anthers uniform. Ovary sessile, linear, falcate; style arcuate, stigma small, terminal. Fruit linear, curved into a ring or spiral, compressed, minutely warty on the margins (ridges); articles subdeltoïd, reticulate veined, dehiscent, the sutures persisting after the fall of the segments; seeds small,  $\pm$  reniform.

Monotypic genus widely distributed in the tropics of the Old World.

*Cyclocarpa* is distinguishable by the coiled pods, small pinnate leaves and leaflets, and also by the membranous stipules and bracts.

**Cyclocarpa stellaris** Afzelius ex Urban\*, Jahrb. bot. Gart. Berlin 3: 248 (1884). **Type:** Sierra Leone near Freetown, *Afzelius* (n.v.).

Specht, Rec. Amer.-Austr. Expdn. Arnhemland 3: 242; 243, Pl. 3.B (1958); van Steenis, Reinwardtia 5(4): 419; 430-431 (1961).

*C. stellaris* Afzelius ex J.G. Baker in Oliver, Fl. Trop. Afr. 151 (1871), *nom. provis.*

Small tufted, erect or spreading, glabrous herbs (occasionally leaf axes sparsely hairy). Petiole 0.5-1 mm long; rachis 3-5 mm long, terminated by a long sharp mucro; leaflets obovate or  $\pm$  oblong, 4-10  $\times$  2-4 mm (upper leaflets larger), apex obtuse, rarely truncate, mucronate; base acute or obtuse; finely and remotely serrulate; petiolules 0.5 mm long. Stipules narrowly ovate, acuminate, (3-)5-8  $\times$  0.5-1.5 mm long, 5-7-nerved. Inflorescences 1-4-flowered; peduncles 0.5-2 mm long; bracts narrowly ovate, acuminate, 1.5-2  $\times$  1 mm. Flowers 4-5 mm long; pedicels 1.5-4 mm long; bracteoles ovate, 1-1.5  $\times$  0.5-1 mm. Upper calyx lip oblong-obovate, 3-3.5  $\times$  1.5-2.5 mm, margins  $\pm$  truncate; lower one narrowly ovate, 4-5  $\times$  1.5 mm, acuminate. Standard 3.5-4  $\times$  3-3.5 mm (claw 0.5 mm long), yellow; wings 4-5  $\times$  2 mm (claw 0.5-1 mm long); keel 4  $\times$  2-3 mm (claw 0.5-1 mm long). Stamens 4-5 mm long. Fruits 5-10-articulate, 4-5 mm diameter; articles 1.5-2  $\times$  2-2.5 mm,  $\pm$  rounded or keeled, minutely warty on the ridges; seeds olive green, 1  $\times$  1-1.25 mm. **Fig. 2B.**

\* The correct authors for *Cyclocarpa* should be Afzelius ex Urban and not Afzelius ex J.G. Baker as indicated in some literature. J.G. Baker (in Oliver 1871) gave only a provisional description of a plant called *C. stellaris* by Afzelius, he did not describe the genus.

**Selected specimens:** Western Australia. Mitchell Plateau, 2 km N of camp, Apr 1982, *Keighery* 4793 (PERTH). Northern Territory. Munmulay Stn, Apr 1973, *Latz* 3923 (CANB,DNA); ditto, Mar 1982, *Dunlop & Taylor* 6238 (BRI,CANB,DNA); Berry Springs near Goose Lagoon, Apr 1978, *Rankin* 1224 (NT); about 10 miles (16 km) N Mudginbarry, May 1970, *Byrnes* 1915 (BRI,CANB,DNA); South Bay, Bikerton Island, Gulf of Carpentaria, Jun 1948, *Specht* 469 (AD,BRI,CANB). Queensland. COOK DISTRICT: Lockerbie, 10 miles (16 km) WSW of Somerset, Apr 1948, *Brass* 18448 (BRI,CANB). NORTH KENNEDY DISTRICT: Kelsey Ck, date unknown, *Michael* 949 (CANB). SOUTH KENNEDY DISTRICT: Koumala, Mar 1977, *Bishop* (BRI).

**Distribution and habitat:** Tropical Africa, South East Asia and northern Australia (Map 6); usually along streams and creeks, or in swampy forests in sandy soil.

**Note:** The leaves of *C. stellaris* resemble some species of *Aeschynomene* L. and also *Smithia* Aiton, but the former differs in the linear long, straight or falcate fruits, while the latter may be separated by its concertina-like fruits and scarious bracts and stipules.

### Subtribe 2. ORMOCARPINAE

Subtribe **Ormocarpinae** Rudd in Polhill & Raven, Adv. Legume Syst. 1: 350 (1981).

Leaves not pellucid dotted, crowded on young shoots or well spaced, imparipinnate. Flowers pedicellate. Calyx campanulate, lobes 5 subequal or 2 upper ones joined to about middle, the lower lobe the longest. Ovary stipitate. Fruits usually with strong continuous nerves on sides.

Seven genera, only *Ormocarpum* occurs in Australia.

### *Ormocarpum*

**Ormocarpum** P. Beauv., Fl. d'Oware et de Benin 1: 95, t. 58 (1807), *nom. cons.* **Type:** *O. verrucosum* P. Beauv. Benth., Fl. austral. 2: 226 (1864); Bailey, Qd Fl. 2: 406 (1900); Backer & Bakh., Fl. Java 1: 598 (1963); Verdc., Fl. Trop. E. Afr., Legum. -Pap. 3: 352-364 (1971)\*, Man. New Guinea Legumes 364-366 (1979)\*; Rudd in Polhill & Raven, Adv. Legume Syst. 1: 350, f. 2.1 & 2 (1981).  
\* with illustration

**Derivation of name:** from Greek *Ormos* (a cord, chain); *carpos* (fruit), referring to the necklace like pods.

Shrubs or small trees with white weak deciduous hairs as well as stiff tuberculate-based hairs (bristles), the latter sometimes gland-tipped. Leaves fasciculate on young short shoots, or distichous, imparipinnate; leaflets alternate, entire. Stipules basally attached, striate, persistent. Inflorescences axillary, few-flowered short racemes or flowers solitary; bracts striate, persistent; bracteoles situated near base of the receptacle, paired, striate, persistent. Calyx campanulate, striate, unequally 5-lobed, lobes longer than tube, 2 upper ones  $\pm$  connate, lower lobe the longest. Petals strongly veined; standard orbicular or broadly ovate, curved back, usually ridged above claw; wings obliquely obovate, slightly puckered above claw; keel broad, obovate  $\pm$  incurved, obtuse or  $\pm$  acute at apex, slightly attached along upper margins. Stamens united, the tube splits into 2 lateral fascicles of 5, anthers uniform. Ovary  $\pm$  stipitate, style curved, stigma minute. Fruits linear, (1-)2-8-jointed, constricted between elongate articles; articles narrow, transversely ellipsoid, compressed, longitudinally ribbed; pericarp corky, indehiscent. Seeds ellipsoid, flattened.

About 20 species, tropical Africa, Madagascar, islands of the Pacific and northern Australia. One species in Australia.

*Ormocarpum* is distinguishable from other members of the tribe Aeschynomeneae in Australia, by its longitudinally ribbed fruits with elongate articles and short necks between articles. The plants are also small trees with usually large fasciculate or distichous leaves.

**Ormocarpum orientale** (Sprengel) Merrill, Intrepr. Rumphius Herb. Amboin. 266 (1917); *Parkinsonia orientale* Sprengel, Syst. 4: 170 (1827). **Type:** Moluccus Island, collector unknown (n.v.). Backer & Bakh., Fl. Java 1: 598 (1963); Verdc., Man. New Guinea Legumes 364; 366, f. 84 (1979).

*Aeschynomene coluteoides* A. Rich., Sert. Astrol. 87, t. 32 (1834). **Type:** Guam, Mariannas (*n.v.*).

*O. sennoides* var. *laevis* Benth., Fl. austral. 2: 226; Bailey, Qd Fl. 2: 406 (1900). **Type:** Endeavour River, R. Brown (*n.v.*).

[*O. sennoides* auct. non DC.: Benth., Fl. austral. 2: 226 (1864)].

Shrubs or small trees; branches drooping, glabrous, with whitish, loose flakey bark, striate, lenticellate. Leaves 9–13-foliolate; petiole 0.8–2.5 cm long; rachis 5–9 cm long; leaflets subobovate or oblong, (1.8–)2.7–4.5 × 0.9–1.8 cm, apex truncate, mucronate; base obtuse (acute in terminal leaflet); glabrous, ± glaucous below; finely lateral nerved and reticulate veined; petiolules 1–1.5 mm long. Stipules ovate, acuminate, (3.5–)5–12 × 2–3 mm. Racemes 2–4-flowered; bracts ovate, 2–3.5 mm long. Flowers 1.5–1.6 cm long; pedicels 1.9–2.5 cm long, filiform; bracteoles ovate, 1.5–3.5 mm long. Calyx tube 4–5 × 6–7 mm, lobes ovate, acute, lower acuminate, 4–8 mm long. Petals white or creamy yellow with purple streaks and transparent veins; standard 1.4–1.6 × 1.1–1.4 cm, shortly clawed (claw to 2.5 mm long); wings 1.2–1.3 cm long (claw to 5 mm long); keel 1.6–1.7 cm long, long clawed (claw 6–8 mm long). Stamens 0.8–1.8 cm long. Fruits 8.5–11.5 cm long, 2–8-articulate; articles 16–25 × 5–5.7 mm, strongly ribbed with raised, ± parallel ribs. **Fig. 2C.**

**Specimens examined:** Queensland. COOK DISTRICT: Endeavour River, date unknown, *Persieh* [AQ235633] (BRI).

**Distribution and habitat:** Indonesia, Solomon Islands, Vanuatu, New Guinea and northern Queensland (**Map 6**); usually in subcoastal forests in swampy areas, river banks and sandy seashores.

**Note:** This species appears to be poorly collected from Australia, the above being the only collection I have seen from here.

### Subtribe 3. STYLOSANTHINAE

Subtribe *Stylosanthinae* (Benth.) Rudd in Polhill & Raven, Adv. Legume Syst. 1: 353 (1981).

Hedysareae subtribe *Sylosanthinae* Benth. in Benth. & Hook., Gen. Pl. 1: 449 (1865), as "*Stylosanthae*".

Leaves without pellucid glands, imparipinnate, 3(–9)-foliolate or 4-foliolate, sometimes with a pattern of tannin deposits on lower surfaces. Stipules free, or adnate towards the base of the petiole, then apiculate and bearing a leaf from the sinus. Flower sessile or subsessile in axil of bracts, or on a common axis, bracts and bracteoles then adjacent. Calyx tube (hypanthium) long and ± filiform, pedicel-like; petals and stamens inserted in throat of calyx. Ovary sessile or subsessile. Fruits usually jointed, but geocarpic and unjointed in *Arachis*, mostly with strong nerves on its sides.

Five genera, two *viz* *Stylosanthes* and *Arachis* occur in Australia.

### *Arachis*

*Arachis* L., Sp. Pl. 2: 741 (1753). **Type:** *A. hypogaea* L.

Bailey, Qd Fl. 2: 408 (1900); Rudd in Polhill & Raven, Adv. Legume Syst. 1: 354, f. 2.20 (1981).

**Derivation of name:** *Arachis* from *Arachidna* of earlier authors (*vide* Smith (1950) 809).

Herbs or low shrubs. Leaves paripinnate with 2 pairs of leaflets, rarely leaves trifoliolate. Stipules adnate to the lower part of petiole, membranous, striate, persistent, 2-lobed with acuminate apiculate lobes, bearing a leaf from the sinus. Inflorescences axillary; flowers sessile, congested in short dense sessile spikes; each flower subtended by a membranous bract and borne on a minute branch of inflorescence which is in the axil of a second bract; bracts keeled, lower one biapiculate with bristly tips, upper one entire, bristly or bifid. Calyx with a long and filiform tube (hypanthium) and 5 membranous lobes, upper 4 lobes connate, toothed, obtuse, the lower free, acute. Standard suborbicular, abruptly clawed; wings oblong or obovate with a lateral spur above the long claw; keel obovate, long clawed, incurved, apex acute, beaked; stamens monadelphous, anthers alternately



long and short, the long ones basifixed, short ones versatile. Ovary sessile; style filiform; stigma minute. Fruits geocarpic (pushed below the soil by the lengthening and reflexing of the gynophore which had stiffened to form a stalk), obloid, 1–5-seeded, constricted between seeds but not jointed, aseptate; walls thick and reticulate veined; indehiscent; seeds ovoid or obloid; cotyledons thick, fleshy, oily.

Twenty two species, mainly eastern South America. One species (*A. hypogaea* L., the ground nut or peanut) is cultivated throughout the warmer parts of the world and has become naturalised in a few places including Australia.

*Arachis* is characterised by the 4-foliolate paripinnate leaves, membranous stipules adnate towards the base of the petiole and the geocarpic fruits.

***Arachis hypogaea* L., Sp. Pl. 2: 741 (1753). Type:** cultivated specimen, in Hort. Upsal., Sweden (LINN (Specimen No. 901.1), microfiche BRI), *fide* Verdc., Fl. Trop. E. Afr., Legum. -Pap. 3: 442 (1971). Bailey, Qd Fl. 2: 408 (1900); Domin, Biblioth. Bot. 89: 208 (1921); Smith, Amer. J. Bot. 37: 802–815, f. 1–19 (1950); Verdc., Fl. Trop. E. Africa, Legum. -Pap. 3: 441–442, f. 63 (1971), Man. New Guinea Legumes 381–382, f. 89 (1979); Rudd in Polhill & Raven, Adv. Legume Syst. 1: 354, f. 2.20 (1981).

Herbs with  $\pm$  erect stems; usually densely hispid with long spreading  $\pm$  rusty hairs on stems and leaf axes. Leaves 4-foliolate; petiole and rachis broadly channelled above; petioles 2.5–5.5 cm long; rachis 0.8–2 cm long; leaflets opposite, obovate or  $\pm$  elliptic, 2.5–6.7  $\times$  1.4–3.6 cm, apex obtuse, truncate or emarginate; base obtuse or  $\pm$  truncate,  $\pm$  oblique; glabrous, or margins and lower surfaces sparsely pilose; lateral nerves 7–14-paired, oblique, prominent below; petiolules 1–2 mm long, densely villous. Stipules 2.8–3.5  $\times$  0.8–1 cm; sheath finely hispid outside; lobes  $\pm$  oblique, narrowly ovate or subtriangular, with long pointed tips, glabrous or ciliate. Inflorescences in the axil of lower leaves; flowers appearing solitary and stalked (calyx tube); lower bract ovate-lanceolate, with long pointed bristly tips, 10–12  $\times$  4–5 mm; upper one narrowly ovate, entire, acuminate, bristly, 7–9 mm long. Calyx tube (hypanthium) long and slender, pedicel-like, 2.3–5 cm long, usually with dense long hispid hairs; lobes 7.5–8 mm long, sparsely hispid outside. Petals yellow, usually with red streaks; standard abruptly shortly clawed, 9–11  $\times$  14 mm; wings 7–11  $\times$  5 mm; keel incurved, 6–7 mm long. Stamens 7–8 mm long, tube fleshy, incurved; ovary densely villous towards the base. Fruits obloid, pale yellow, 2.2–3.8  $\times$  1.2–1.8 cm, constricted but aseptate between the 2–4 seeds, glabrous. **Fig. 2D.**

**Specimens examined:** Queensland. COOK DISTRICT: Endeavour River, in 1883, *Persieh* (MEL); Cooktown, *Parker* (AD 98572030). WIDE BAY DISTRICT: 4 miles [6.4 km] SW of Gympie on Mary Valley Rd, Mar 1958, *Marlow* (BRI). MORETON DISTRICT: Old North Rd, Lawnton, 19 miles [30.4 km] N of Brisbane, Dec 1931, *Blake* 3085 (BRI).

**Distribution and habitat:** Native of South America (probably Brazil), grown throughout the warmer parts of the world for its fruits. Occasionally found as an escape from cultivation in a few countries including Australia (Queensland) (**Map 7**).

*A. hypogaea* is recognisable by the 2-paired leaflets with prominent, closely arranged,  $\pm$  parallel lateral nerves, hispid stems and leaf axes, and by the oblong, swollen, reticulate-ribbed pods.

**Common name:** Peanut or Ground nut.

**Uses:** The peanut is one of the chief economic plants of the world. It has been cultivated for centuries in South America and is now extensively grown in many countries for their fruits.



*Stylosanthes*

**Stylosanthes** Swartz, Prod. Veg. Ind. Occ. 108 (1788), Fl. Ind. Occ. 3: 1280, t. 25 (1806).

**Type:** *S. procumbens* Swartz nom. illeg. = *S. hamata* (L.) Taubert (*Hedysarum hamatum* L.).

Mohl., Ann. Miss. Bot. Gard. 44: 299–354 (1958), Rhodora 65(763): 245–258 (1963); Verdc., Man. New Guinea Legumes 371–375 (1979); Burt & Williams, A.M.R.C. Review No. 25 (1975); McVaugh, Fl. Novo-Galiciana, 5: Legum. 700–704 (1987).

**Derivation of name:** from Greek *Stylos* (pillar, column); *anthos* (flower) – column flower, alluding to the column-like calyx tube.

Herbs or subshrubs; usually hispid. Leaves pinnately 3-foliolate. Stipules adnate to lower part of petiole, biapiculate, bearing a leaf from the sinus, lobes aristate, bristly, sheath cylindrical, persistent. Inflorescences axillary or terminal, sessile, spicate or headlike, 1–many-flowered, composed of 1-flowered spikes placed in axil of primary bracts, the lowermost in the axil of primary leaf; primary (outer most) bracts sheathing, very imbricate, stipule-like, 1–3-foliolate; secondary ones ovate, 2- or 3-fid, hyaline, ciliate, persistent. Flowers sessile, each accompanied by a secondary bract, and 1 or 2 hyaline, linear, ciliate bracteoles and sometimes by a plumose filiform axis (axis rudiment) representing a reduced part of the inflorescence now absent. Calyx tube (hypanthium) long filiform, pedicel-like; lobes 5, membranous, ciliate, united at their base, upper 4 lobes, connate for about half their length, obtuse, lower one free, narrow, acute. Petals and stamens inserted in throat of calyx. Standard obovate or suborbicular, emarginate, shortly clawed; wings free, oblong or obovate, laterally spurred and with small pockets on its blade; keel incurved, appendaged (as the wing). Stamens monadelphous, tube splits into 2, anthers dimorphic, 5 anthers long and basifixed alternating with 5 short versatile ones. Ovary linear, subsessile, 2- (or 3)-ovuled; style curved, filiform, persistent, stigma minute. Fruits small, sessile, 2-articulate, both articles fertile, or lower abortive; upper ones mostly ± obloid, beaked (remnant style), laterally compressed, keeled, reticulate veined; seeds ovoid or ellipsoid, compressed.

About 25 species, mostly in South America, a few in tropical and warm temperature areas of the world. Several species have been introduced into Australia since 1900 (Burt & Williams 1975), five now naturalised.

*Stylosanthes* can be distinguished from other members of the tribe Aeschynomeneae by the 3-foliolate leaves, biapiculate stipules adnate to base of petiole; sessile, mostly dense inflorescences and by the very small fruits with short or long beaks.

J. Vogel (1838) divided the genus into two sections.

**Section 1.** *Stylosanthes* (as “*Eustylosanthes*”). **Type:** *S. viscosa* Swartz

Flowers not subtended by an axis rudiment. Inner bracteoles 1.

**Section 2.** *Styposanthes* J. Vogel, Linnaea 12: 68 (1838). **Type:** *S. hamata* (L.) Taubert

Flowers (at least the lower ones) subtended by an axis rudiment. Inner bracteoles 2.

**Note:** In the following account the species are not treated separately under their respective sections since only five species are naturalised in Australia, and because *S. humilis* Kunth can have the characters of both sections.

The species naturalised in Australia resemble each other closely, having similar habit, aspect, indumentum, leaves and flowers and are difficult to identify without fruits. A whole series of characters are therefore used in the following key to the species to separate them. Differences of closely related species are also discussed under the respective species.

## Key to the species

1. Flowers not subtended by an axis rudiment. Inner bracteoles 1. . . . . 2  
    Flowers (at least the lower ones) subtended by an axis rudiment. Inner  
    bracteoles 2 . . . . . 4
2. Fruit beaks 3.5–7 mm long. Stems hairy on one side with lines of fine  
    hairs; bristles scattered all over the stem. Leaflets not with a reticulate  
    pattern of tannin on lower surfaces . . . . . 3. *S. humilis*  
    Fruit beaks 0.2–1 mm long. Stems either hairy all over, or only on one  
    side with lines of fine hairs; bristles and glandular hairs present all  
    over the stem, or absent. Leaflets with a reticulate pattern of tannin  
    on lower surfaces . . . . . 3
3. Stems densely hairy all over with fine hairs, glandular hairs and bristles.  
    Fruits with 1 or 2 fertile articles; beaks strongly uncinat, to 1 mm  
    long. Leaflets obtuse. Inflorescences narrow . . . . . 1. *S. viscosa*  
    Stems densely or sparsely bristly all over, and with lines of dense fine  
    hairs on one side of stem, puberulous elsewhere, rarely glabrous, often  
    glandular hairy. Fruits with 1 fertile article; beaks bent, to 0.5 mm  
    long. Leaflets mostly acute. Inflorescences short and broad . . . . . 2. *S. guianensis*
4. Beak of fruits 1.5–2.5 mm long. Stems finely hairy and bristly all over;  
    glandular hairs sometimes present. Leaflets obtuse usually with a  
    reticulate pattern of tannin on lower surfaces . . . . . 5. *S. scabra*  
    Beak of fruits 3–7 mm long. Stems finely hairy on one side with lines of  
    fine hairs; bristles scattered all over the stem or absent; glandular hairs  
    absent. Leaflets acute or acuminate, not as above . . . . . 5
5. Stems and bracts finely white hairy; bristles absent. Beak of fruits 3–5.5  
    mm long; both articles fertile. Axis rudiment persistent. Lateral nerves  
    5–7-paired, thick, very conspicuous . . . . . 4. *S. hamata*  
    Stems and bracts finely hairy as well as bristly. Beak of fruit 3–7 mm  
    long; only upper article fertile. Axis rudiment deciduous. Lateral nerves  
    2- or 3- (or 4)-paired, slender, thickening only at their tips . . . . . 3. *S. humilis*

1. *Stylosanthes viscosa* Swartz, Prod. Veg. Ind. Occ.: 108 (1788). Type: not designated.  
 Mohl., Rhodora 65 (763): 257, f. 27; 258 (1963); McVaugh, Fl. Novo-Galiciana,  
 5: Legum. 703 (1987)

Subshrubs or herbs with ascending stems to 0.5 m; usually viscid, and densely hairy with soft hairs, bristles and glandular hairs on stems, leaf axes, and stipules; glandular hairs denser on stems and leaf axes. Free part of petiole and rachis 9–12 mm long; leaflets elliptic, 8–13 × 3–6 mm, apex obtuse or subacute, mucronate; base obtuse or subacute; both surfaces finely hairy, lower surfaces also with scattered small bristles and glandular hairs (especially on midrib), and with a reticulate pattern of tannin; lateral nerves 3- or 4-paired, feeble ± inconspicuous, only thickening towards their tips (apex of leaflet with 3 prominent nerves, made up of the midrib (which extends to form a sharp mucro) and the tip of 2 top lateral nerves); petiolules to 0.5 mm long. Stipules 10–12 mm long, the sheath slightly longer than the teeth, 6–8 mm long, 5-nerved, finely hairy and bristly. Inflorescences narrow and long, 12–18 × 4–8 mm, 4–7(–16)-flowered; primary bracts 10–14 mm long, 1-foliate (the leaflet nearly as long as in the ordinary leaf), finely hairy and bristly; secondary ones usually bilobed, 4–4.5 × 2 mm, ciliate; bracteoles 1, narrowly ovate, 3.5–4 × 0.7 mm, ciliate. Axis rudiment absent. Calyx tube 4–4.5 mm long, lobes to 2.5 mm long. Petals yellow with maroon stripes; standard 4.5–5 × 5 mm; wings 4–4.5 × 4 mm; keel 3–4 × 4 mm. Stamens 3–4 mm long. Fertile articles 1 or 2; upper ones 2.5 × 2 mm, shortly beaked, laxly reticulate veined, puberulent or papillose especially on the ridge; beak very strongly uncinat, about 1 mm long, shortly hairy; seeds 2 × 1.5 mm. **Fig. 21.**

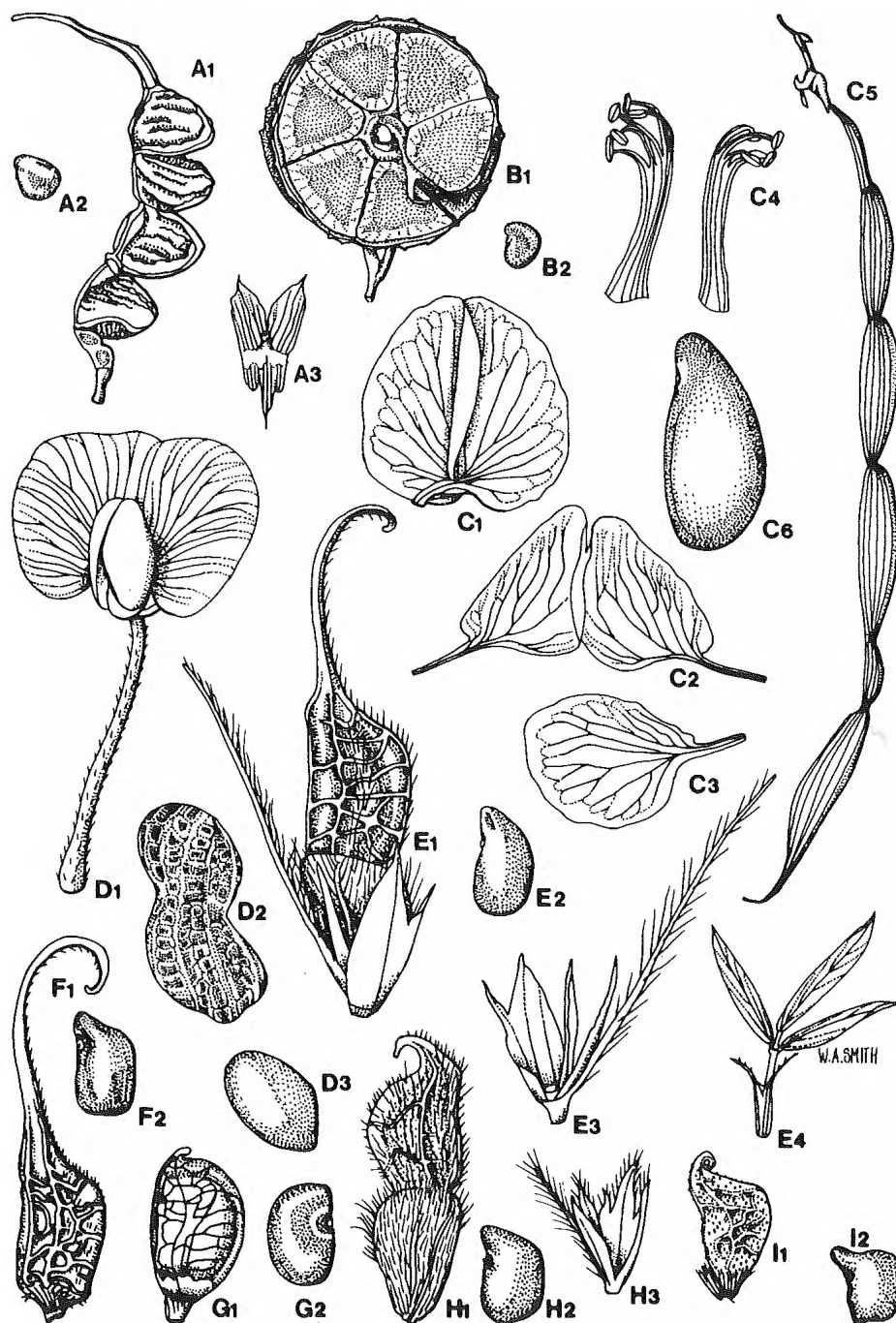


Fig. 2. A. *Smithia sensitiva*: A<sub>1</sub>, fruit × 6; A<sub>2</sub>, seed × 6; A<sub>3</sub>, stipules × 2. B. *Cyclocarpa stellaris*: B<sub>1</sub>, fruit × 6; B<sub>2</sub>, seed × 6. C. *Ormocarpum orientale*: C<sub>1</sub>, standard × 2; C<sub>2</sub>, keels × 2; C<sub>3</sub>, wing × 2; C<sub>4</sub>, stamens × 2; C<sub>5</sub>, fruit × 1; C<sub>6</sub>, seed × 6. D. *Arachis hypogea*: D<sub>1</sub>, flower × 2; D<sub>2</sub>, fruit × 1; D<sub>3</sub>, seed × 1. E-I. *Stylosanthes*: E. *S. hamata*: E<sub>1</sub>, fruit × 6; E<sub>2</sub>, seed × 6; E<sub>3</sub>, part of the inflorescence × 6 showing (a) secondary bract (b) 2 bracteoles (c) axis rudiment; E<sub>4</sub>, stipule × 1. F. *S. humilis*: F<sub>1</sub>, fruit × 6; F<sub>2</sub>, seed × 6. G. *S. guianensis*: G<sub>1</sub>, fruit × 6; G<sub>2</sub>, seed × 6. H. *S. scabra*: H<sub>1</sub>, fruit × 6; H<sub>2</sub>, seed × 6; H<sub>3</sub>, part of inflorescence × 6, showing (a) secondary bract (b) 2 bracteoles, (c) axis rudiment. I. *S. viscosa*: I<sub>1</sub>, fruit × 6; I<sub>2</sub>, seed × 6. A, Durrington 343; B, Brass 18448; C<sub>1</sub>-C<sub>4</sub>, Vandenberg & Mann NGF 42285, C<sub>5</sub>-C<sub>6</sub>, Turner BRI 346261; D, living material; E, Stanley 80214; F, Pullen 8852; G, Sharpe 3651; H, Clarkson 5068; I, Cowie 309.

**Specimens examined:** Northern Territory. Berrimah, 12°27'S, 130°55'E, Darwin, Mar 1977, *Dunlop* 4168 (DNA); Corndori Billabong, 12°31'S, 132°52'E, Jabiru, Apr 1986, *Cowrie* 309 (BRI).

**Distribution and habitat:** Widespread in northern and eastern South America and extending to tropical America. Introduced into Australia (in 1965) from Brazil and now naturalised in the Northern Territory (**Map 8**).

*S. viscosa* can be distinguished by the viscid, densely glandular hairy stems and leaf axes, and by the fruits with 1 or 2 fertile articles and short, strongly uncinate beaks (to 1 mm long). It resembles *S. scabra* but in the latter species the lateral nerves are very conspicuous and raised, the stems are very sparsely glandular hairy, and the fruits have 2 fertile articles, and have longer beaks (to 2.5 mm long).

**2. *Stylosanthes guianensis*** (Aublet) Swartz, Svenska Vet. Akad. Handl. 10: 301 (1789); *Trifolium guianensis* Aublet, Pl. Guiana 2: 776, t. 309 (1775). **Type:** French Guiana, Macouria, Aublet s.n. (B.M. n.v.). Mohl., *Rhodora* 65 (763): 249, 254, f. 19 (1963); t'Mannetje, Aust. J. Bot. 25: 347–362; f. 1, 2, 7, 8, 9 (1977).

*S. gracilis* Kunth, Nov. Gen. et Sp. Pl. 6: 396–397, t. 596 (1823). **Type:** Venezuela, Crescit in monte Turimiquiri, prope El Cocollar, alt 700 hex. (Provincia Novae Andalusiae), *A. Humboldt* & *A. Bonpland* (n.v.)

Herbs or subshrubs with usually much branched, erect or semierect stems to 2 m high; usually setose and viscid; stems hairy on one side with a line of dense fine hairs, puberulous elsewhere, usually densely hispid all over with spreading, long, brownish or purple bristles, rarely subglabrous, sometimes with scattered glandular hairs. Free part of petiole and rachis 3–10 mm long, densely long hairy and bristly, or glabrous; leaflets narrowly elliptic or ovate, 13–44 × 3–9 mm, apex acute or subacute, mucronate; base acute or ± obtuse; entire or minutely spinulose toothed; glabrous or lower surfaces with sparse fine hairs and bristles (midribs bristly), and also with tannin deposits; lateral nerves 4–7-paired, dries whitish, basal pair thick, others usually slender, thickening only towards their tips; petiolules to 0.5 mm long, pubescent. Stipules 1–2.2 cm long, usually flushed with red, sheath nearly as long as the long aristate lobes, 11–15-nerved, glabrous or bristly. Inflorescences short, broadly ovoid, loosely arranged, 1–1.5 × 1.2 cm, 2–32-flowered; primary bracts 1-foliate, 0.8–2.1 cm long, densely fine hairy outside and bristly, (bristles sometimes gland-tipped); pubescent from apex to the middle inside; secondary ones 6 mm long, entire or dentate; bracteoles 1, narrowly ovate, 4.5–6 × 0.5–1 mm, ciliate. Axis rudiment absent. Calyx tube 2–6 mm long, lobes 2.5–3.5 × 1–1.5 mm. Petals cream to orange-yellow with red or dark streaks; standard 4.5–6 × 3.5–4 mm; wings 2.5–4 × 3–4 mm; keel 2.5–4 × 2–3 mm. Stamens 3–4 mm long. Fertile articles 1, ± ovoid with a very minute beak, 2.5–3 × 1–2.5 mm, obscurely reticulate veined, glabrous or with few hairs at apex; beak strongly bent, 0.1–0.5 mm long; seeds pale brown. **Fig. 2G.**

**Selected specimens:** Western Australia. Port Hedland area, in 1953, *Runiuh* (PERTH). Northern Territory. Near Mudginbarry–Oenpelli Rd, May 1986, *Cowie* 311 (DNA); Port Keats Mission Stn, Sep 1972, *Robinson* (DNA); Tortilla Flats, Jul 1973, *Parker* 123 (DNA). Queensland. COOK DISTRICT: Innisfail, Jul 1957, *Dodd* (BRI). NORTH KENNEDY DISTRICT: Mission Beach, Jul 1966, *Hyland* 3899 (BRI). SOUTH KENNEDY DISTRICT: Wollombi, Mackay, Jun 1960, *Chiconi* (BRI). PORT CURTIS DISTRICT: Between Stockyard Point and Five Rocks, about 15.5 km ENE of Byfield, Jul 1977, *Clarkson* 1008 & *Stanley* (BRI). MORETON DISTRICT: 2 km N of Coolumb Beach, Sep 1975, *Sharpe* 1303 (BRI).

**Distribution and habitat:** Native of South America, widespread in northern and central South America. It is the most widely distributed species of the genus; it had been introduced as a pasture legume and cover crop and subsequently become naturalised in most tropical countries, viz tropical America, Africa, New Guinea and Australia (**Map 9**); usually along roadsides and other disturbed areas. Several strains have been introduced into Australia from South America (between 1931–75).

*S. guianensis* is distinguishable by the coarsely hairy stems with brown or purple hispid hairs; broad inflorescences with greenish or purple bracts, and fruits with 1 fertile article and very minute, bent beaks.

**Common name:** Common stylo.

**Uses:** As a pasture legume and as a cover crop.

**Note:** The species varies considerably in the density of indumentum and in the attributes of their leaves. Six varieties were recognised by t'Mannetje (1977), the naturalised plants in Australia are referable to the typical variety.

**3. *Stylosanthes humilis* Kunth, Nov. Gen. et Sp. 6: 506, t. 594 (1823). Type:** Venezuela, Crescit ad Orinocum (Orinoco), prope Carichanam, locis calidissimis, *A. Humboldt* & *A. Bonpland* (n.v.).

Mohl., *Rhodora* 65 (763): 245–258, f. 11 & 30 (1963); Nooteboom, Reinwardtia 5(4): 447–450 (1961); Pedley, *Austrobaileya* 1(1): 37–38 (1977); Verdc., *Man. New Guinea Legumes* 373; 374, f. 87 (1979).

*S. sundaica* Taubert, Verh. Brand. 32: 21 (1890). **Type:** Sunda Island, collector unknown (n.v.).

[*S. mucronata* auct. non Willd.: Bailey, Qd Agr. J. 31: 115–116, t. 99 (1913); C. White, Proc. R. Soc. Qd 34: 34 (1923)]

Herbs or subshrubs, with tufted, branched, decumbent stems to 60 cm; usually densely hairy on one side of the stem with dense soft fine hairs; the other side puberulent or glabrous; bristles usually scattered all over the stem (dense below nodes). Free part of petiole and rachis (2–)5–11 mm long, finely hairy and bristly; leaflets narrowly elliptic or ovate, (7–)10–38 × 2–4(–6) mm, apex acute or acuminate; base acute or subobtusely; glabrous above, finely hairy or sparsely bristly on lower surfaces and margins, usually papillose below; lateral nerves 2- or 3- (or 4)-paired, oblique, ± feeble, sometimes thickening towards apex; petiolules to 0.5 mm long, hairy or glabrous. Stipules scarious with green tips, (3–)6–11 mm long, sheath usually as long as the aristate lobes, 5–7-nerved, finely hairy and bristly. Inflorescence short, ovoid or capituliform, 4–15 × 6–10 mm, 3–11-flowered; primary bracts 1–3-foliate, 5–15 mm long, finely hairy and bristly outside; secondary ones 4–4.5 × 1.5–3 mm, entire or toothed; bracteoles 1 or 2, narrowly ovate, acuminate, 3–4.5 × 0.5–1 mm, densely ciliate. Axis rudiment rarely present, then deciduous. Calyx tube 2–5 mm long, lobes 1.5 × 0.5–1 mm. Petals yellow or orange; standard 3–4.5 × 2–3 mm; wings 4 × 2 mm; keel 2–3.5 × 2 mm. Stamens 3–4 mm long. Fertile articles 1, rarely 2, upper articles long beaked, 2.5–3.5 × 1.5–2.5 mm, ridged above, keeled and prominently reticulate veined; sparsely appressed hairy; beak protruding from the inflorescence, 3.5–7 mm long, strongly curved, uncinatate at apex, sparsely hairy; seeds ovoid, 2.5 × 1.5 mm. **Fig. 2F.**

**Selected specimens:** Western Australia. Derby, May 1962, *Royce* 6881 (PERTH); Great Northern Highway, 200 km N of Halls Creek, Apr 1985, *Aplin et al* 392 (PERTH). Northern Territory. Victoria Settlement, Cobourg Peninsula, May 1963, *Letts* (DNA); Gove Peninsula, Apr 1974, *Hinz* B7494R (DNA); On Munmarlary track S of junction with Arnhem Highway, 11 km N of Nourlangie Ranger Stn, Jun 1980, *Craven* 6523 (CANB); Mullapunya Spring Stn., 51 km from Barkly Tableland Highway, May 1984, *Halford* 84523 (DNA). Queensland. COOK DISTRICT: Vallack Point, 1.5 miles [2.4 km] S of Somerset, May 1948, *Brass* 18802 (BRI, CANB). BURKE DISTRICT: Mornington Island, May 1963, *Tindale* (AD). NORTH KENNEDY DISTRICT: Castle Hill, Townsville, Jun 1931, *Blake* 5969 (BRI). PORT CURTIS DISTRICT: Couti-Outi, 70 miles (112 km) NNW of Rockhampton, Jun 1960, *Johnson* 2007 (BRI). WARREGO DISTRICT: 45 miles (72 km) S of Charleville on Warrego River, Apr 1962, *Ebersohn* E328 (BRI). MORETON DISTRICT: D.P.I. Complex, Indooroopilly, May 1981, *Dilleward & Stanley* 554 (BRI).

**Distribution and habitat:** Native of South America; widespread in Central South America and tropical America. Naturalised in most tropical countries including Malaysia, Indonesia, New Guinea and Australia. It was introduced into northern Australia (about 1900) probably from Brazil and now widely naturalised in Queensland and parts of Northern Territory and Western Australia (**Map 10**); usually along roads and other disturbed areas. The species is common around Townsville.

*S. humilis* is easily distinguished by the long beaks of fruits which protrude from the inflorescences; by the bristly bracts and stems, and also by the lines of dense fine hairs on one side of the stem. Some forms of this can be confused with *S. hamata*, but may be separated by the non bristly stems and bracts, and by the very conspicuous lateral nerves which are also greater in number (up to 7-paired) of the latter species.

**Common name:** Stylo, Townsville stylo or Townsville lucerne.

**Uses:** Regarded as a very useful fodder legume in Australia.

**Note:** *S. humilis* varies considerably in hairiness, in the shape and size of leaflets and articles, in the number of bracteoles, and in the absence or presence of an axis rudiment. The majority of the Australian specimens have only 1 bracteole and no axis rudiment, but a few plants however are provided with a second bracteole and a small deciduous axis rudiment (very rarely); these are probably the same as Malesian ones previously called *S. sundaica* Taubert (Pedley 1977).

**4. *Stylosanthes hamata* (L.) Taubert, Verh. Bot. Brand. 32: 22 (1890); *Hedysarum hamatum* L., Syst. Nat. 10: 1170 (1759). Type:** Jamaica, Sloan Herb. t. 119, f. 2. Mohl., Rhodora 65 (763): 248; 254, f. 16 (1963).

*S. procumbens* Swartz, Prod. Veg. Ind. Occ.: 108 (1788) *nom. illeg.* Type: Jamaica *loc. cit.*

Herbs with usually much branched, erect (rarely  $\pm$  procumbent) stems to 70 cm high; stems usually densely hairy on one side with a line of fine pilose hairs, the rest of the stem glabrous. Free part of petiole and rachis (2–)4–7 mm long, channelled above, pilose at margins; leaflets elliptic, narrowly ovate to elliptic-ovate, (10–)13–29  $\times$  2–5 mm, apex acute or acuminate; base acute; both surfaces glabrous, or lower ones finely sparsely hairy, ciliate; lateral nerves thick, prominently raised below, (4–)5–7-paired, oblique, ascending and arched at their tips, dried whitish; petiolules to 0.5 mm long, pilose. Stipules (8–)11–16 mm long, sheath nearly as long as the long aristate lobes, 5–9 mm long, 5–9-nerved, glabrous or with fine appressed hairs outside, ciliate. Inflorescences small, narrow, oblong or ovoid, 1.2–1.5  $\times$  1.2–1.5 cm, 4–11-flowered; primary bracts unifoliate, (0.7–)1–2 cm, sheath 5–7-nerved, usually sparsely villous with white hairs on both surfaces, ciliate; secondary ones 3-dentate, 4  $\times$  1.5 mm; bracteoles 2, narrowly ovate, attenuate, acuminate, ciliate, 3–4  $\times$  1–1.5 mm. Axis rudiment present (usually in the lower flowers), 4–6 mm long, densely villous. Calyx tube 3–6  $\times$  1 mm, lobes 2  $\times$  0.8–1 mm. Petals yellow; standard 4–5  $\times$  3–3.5 mm; wings 4.5  $\times$  3.5 mm; keel 3–4  $\times$  2 mm. Stamens 4–5 mm long. Fruits 2-articulate, the lower one densely villous; upper one long-beaked, ovoid, 3–4.5  $\times$  1.5–2 mm, prominently reticulate-veined, glabrous or with sparse hairs along the ridge only; beak 3–5.5 mm long, curved, uncinatate at apex; seeds dark brown, 2–2.5  $\times$  1–1.5 mm. **Fig. 2E.**

**Specimens examined:** Western Australia. Derby to Broome Rd, 19.6 km S of Derby, Apr 1985, *Aplin et al* 56 (PERTH); S of Hunter Ck, E of Cape Leveque, Dampierland Peninsula, Aug 1985, *Kenneally* 9468 (PERTH). Northern Territory. IB Bore, Benmarra Stn, May 1984, *Strong* 109 (DNA); Soudan Stn, 9 km W of H.S., May 1977, *Henshall* 1796 (CANB,DNA); Arnhem H/W, S. Alligator, Oct 1984, *Cowie* 192 (CANB); about 17 km from ENE of Soudan H.S., Aug 1978, *Donner* 6139 (AD). Queensland. COOK DISTRICT: 17 km along main Weipa Rd off Peninsula Rd, Apr 1988, *Forster* 4046 & *Liddle* (BRI). NORTH KENNEDY DISTRICT: NW of Townsville, Feb 1980, *Stanley* 80219 (BRI). BURKE DISTRICT: 13 miles [20.8] km from Cloncurry towards Kynuna along Landsborough H/W, Jul 1979, *Carriage* 16 (BRI).

**Distribution and habitat:** Native of South America; widespread in the Caribbean Islands, and tropical America. Introduced into Australia (between 1961 and 1975) from South America (Venezuela), naturalised in northern Australia and central Queensland (**Map 11**); along riverbanks, in swampy areas and disturbed areas.

*S. hamata* is distinguishable by the white hairy, non bristly stems and bracts, lines of long fine hairs on one side of stem, and by the presence of a  $\pm$  villous axis rudiment. It can be confused with *S. humilis* which has similar leaves, but bracts and stems are bristly, and lateral nerves fewer (only 2 or 3 (–4) pairs),  $\pm$  feeble in the latter species.

**Common name:** Caribbean stylo.

**5. *Stylosanthes scabra* J. Vogel, Linnaea 12: 69 (1838). Type:** Brazil in Serra da Moeda, *F. Sello* as “*Sellow*”, & *B. Luschnath* ad Baia (syn. *n.v.*). Mohl., Rhodora 65(763): 247; 251, f. 6 (1963).

Subshrubs with erect, much branched stems to 1 m high; usually viscid and hairy; densely hairy on stems and leaf axes with fine long hairs and bristles, sometimes sparsely glandular hairy, rarely  $\pm$  glabrous. Free part of rachis and petiole 6–9(–15) mm long. Leaflets elliptic, 10–22(–28)  $\times$  3.5–7(–9) mm, apex subacute or obtuse, mucronate; base subacute or subtruncate; finely pilose above, lower surfaces and margins densely or sparsely hairy with soft long hairs and scattered short bristles and glandular hairs, usually



with a reticulate pattern of tannin below; lateral nerves 4–6-paired, oblique and ascending, thick and very conspicuous, dries whitish; petiolules to 0.5 mm long. Stipules (9–)12–14 mm long, sheath nearly twice the length of the aristate lobes, 7–9-nerved, sparsely finely hairy and bristly. Inflorescences short, oblong, 10–18 × 8–12 mm, 7–9-flowered; primary bracts unifoliate, 11–12.5 mm long, sheath longer than teeth, 5–7-nerved, densely hairy and ciliate; secondary ones ovate, 3-dentate, 2–3 × 1.5–2 mm, ciliate; bracteoles 2, narrowly ovate, acute, 2.5–3 × 0.5 mm, ciliate. Axis rudiment 5 mm long, rusty villous. Calyx tube (3–)4–6 mm long, lobes 2 mm long. Petals yellow with red markings; standard 4–6 × 3.5–6 mm; wings 4–5 × 3–4 mm; keel 3.5 × 3 mm. Stamens 3.5–4 mm long. Fertile articles 2; upper article 5–6.5 mm long (including short beak), 2–2.5 mm diameter, obscurely reticulate veined, sparsely hairy except densely appressed hairy ridge; lower article 3 × 2 mm, densely appressed hairy; beak 1.5–2.5 mm long, slightly curved, uncinat at apex; usually densely long hairy; seeds 2 × 1 mm, brown. Fig. 2H.

**Specimens examined:** Western Australia. Kimberleys, Gibb River–Kalumburu Mission Rd, 2 km S of Drysdale River crossing, ± 182 km WSW of Wyndham, May 1976, *Beaglehole* 51700 (PERTH). Northern Territory. Tortilla Flats, Jul 1973, *Parker* 122 (DNA); Bulliita Stn airstrip, Feb 1986, *Clarke* 345 and *Wightman* (DNA). Queensland. COOK DISTRICT: Weipa, top of A and B Slurry Dam, May 1981, *Morton* 1291 (BRI); Road to Bolt Head off Maloney Springs to Carron Valley Rd, Jun 1989, *Forster* 5489 (BRI); Bamboo Range, 19 km past Musgrave on Coen Rd, Jun 1989, *Forster* 5230 (BRI); Source of Shanty Ck, 1 km SW of Stones Hill, Jul 1989, *Forster* 5603 (BRI).

**Distribution and habitat:** Native of South America where it is widespread. Introduced into Australia (in 1965) from Brazil, and now naturalised in northern Australia (Map 12); along roadsides and other disturbed areas, in open forests.

*S. scabra* is distinguishable by the elliptic, obtuse or subacute leaflets; thick, very conspicuous lateral nerves; densely hairy stems with long fine ordinary hairs, scattered bristles and glandular hairs, and also by the fruits with 2 fertile articles and a long hairy beak to 2.5 mm long. This species can sometimes be confused with *S. guianensis* (Aublet) Swartz, and *S. viscosa* Swartz, but the former differs in having lines of fine hairs on one side of stem and fruits with 1 fertile article and a minute beak, while the latter differs in the densely glandular hairy stems, petioles and rachis, and fruits with 1 fertile article and a short strongly uncinat beak.

#### Subtribe 4. POIRETIINAE

Subtribe **Poiretiinae** (Burkart) Rudd in Polhill & Raven, Adv. Legume Syst. 1: 353 (1981).

Hedysareae subtribe Poiretiinae Burkart, Darwiniana 3: 124 (1939) as “Poiretinae”.

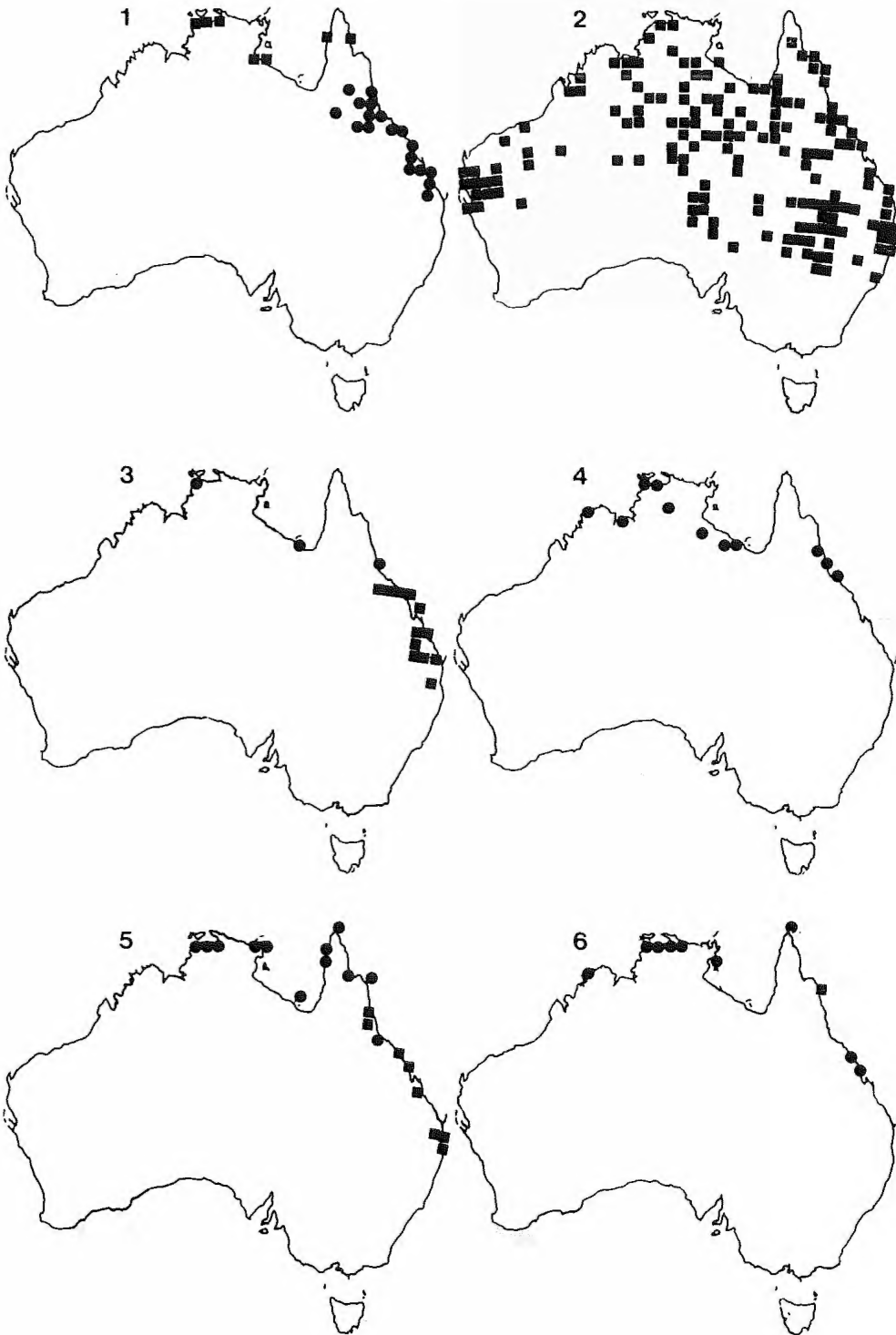
Leaves usually with pellucid or pustular glands, leaflets digitately (1 or) 2 or 4, or numerous and imparipinnate. Flowers sessile or pedicellate, pedicels usually without joints or bracteoles. Calyx tube short. Anthers dimorphic. Fruits with 1 to several, quadrate, subsimilar, reticulately veined articles, often ornamented with crests, bristles or glands.

Four genera, only *Zornia* (Reynolds & Holland 1989) occurs in Australia.

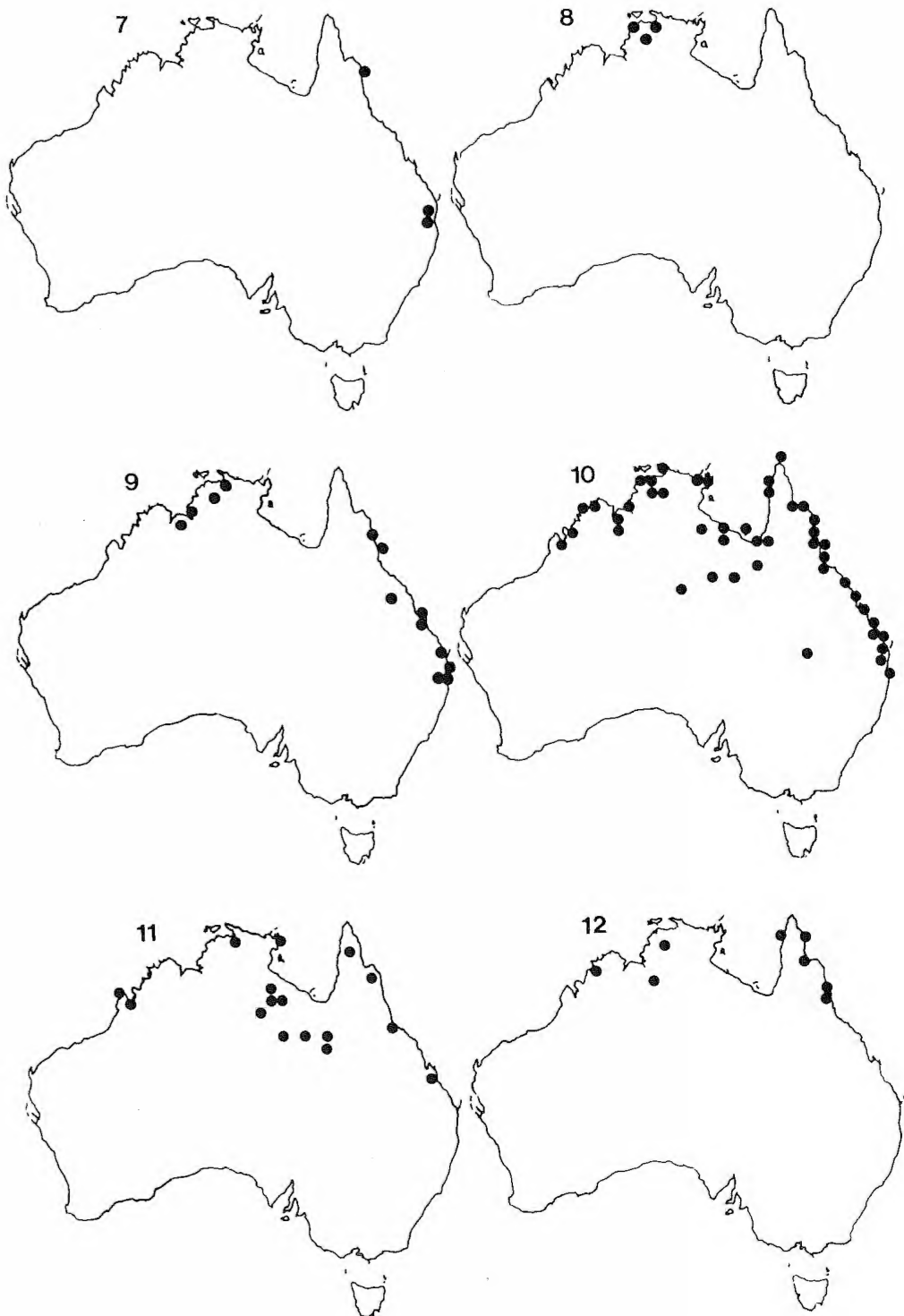
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Maps 1-6. 1-4. *Aeschynomene* spp.: 1. ■ *A. aspera*, ● *A. micrantha*. 2. *A. indica*. 3. ■ *A. brevifolia*, ● *A. americana*. 4. *A. villosa*. 5. *Smithia* spp.: ● *S. conferta*, ■ *S. sensitiva*. 6. ● *Cyclocarpa stellaris*, ■ *Ormocarpum orientale*.



Maps 7-12. 7. *Arachis hypogea*. 8-12. *Stylosanthes* spp.: 8. *S. viscosa*. 9. *S. guianensis*. 10. *S. humilis*. 11. *S. hamata*. 12. *S. scabra*.

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